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(71) Applicant: Yang, Tai-Her
5-1 Taipin Street
Si-Hu Town Dzan-Hwa(TW)

(72) Inventor: Yang, Tai-Her
5-1 Taipin Street
Si-Hu Town Dzan-Hwa(TW)

(74) Representative: Arthur, Bryan Edward et al,
4 Dyers Buildings Holborn
London, EC1N 2JT(GB)

(54) Optionally passive or active bicycle-type exerciser with massage means.

(57) This invention relates to an exercise bike. Briefly, an exercise bike in accordance with the present invention comprises a frame, a first chair, a frictional flywheel, a dynamoter coupled by a pedal driving unit for producing electric power and serving as a driving source, a manually operable reaction training device, an auxiliary chair and a massage unit.

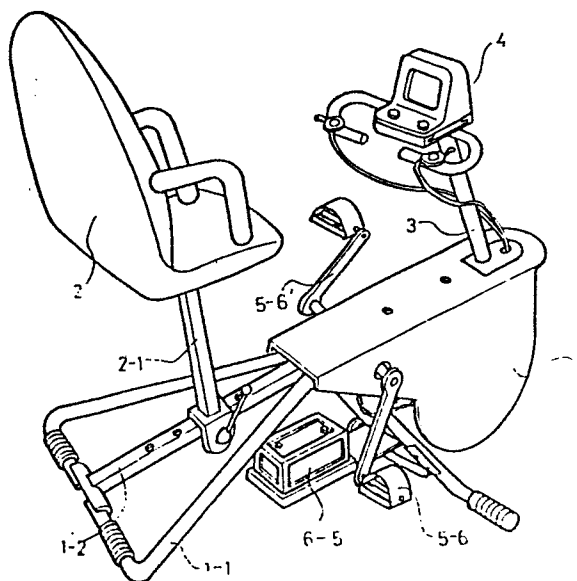


Fig. 1

TITLE:

DOUBLE FUNCTIONAL EXERCISE BIKE FOR EXERCISE AND
TRAINING (2)

SCOPE OF THE INVENTION:

It is limited in the range of exercise bikes.

BACKGROUND OF THE INVENTION:

The present invention is provided to promote the entertainment of indoor sporting equipments and rise the exercise interest of people.

SUMMARY OF THE INVENTION:

This is an improved design of double functional exercise bike for exercise and training which relates to the active motion and passive motion of muscle reaction and mental establishment of human relation, and rehabilitation; it is constituted by a set of stationary main body of bike frame on which there is a reclining and sitting chair, frictional fly wheel which is used to produce damping, dynamotor set which is coupled by pedal driving element in order to produce electric power and to be used as driving source, manual operational reaction training device, and auxiliary chair which is provided for the second one to join in and can promote entertainment of this multi-functional sport equipment and the present invention further utilizes the power supply generated by the man-powered tread mill to vibration-type massager, thus making the exerciser simultaneously accepting the massage as the third useful design of the above series.

BRIEF DESCRIPTION OF THE DRAWING:

Fig. 1 is a graphic view of embodiment A of the reclining and sitting active passive exercise bike.

5 Fig. 2 is a graphic view of embodiment B of the reclining and sitting active passive exercise bike.

Fig. 3 is a circuit diagram of the reclining and sitting active passive exercise bike.

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Fig. 4 is an embodiment of circuit of placing common armature dynamotor set.

15 Fig. 5 is an embodiment of circuit of placing permanent magnet type two-phase step driving dynamotor set.

Fig. 6 is an embodiment of circuit of placing armature independent dynamo and generator set.

20 Fig. 7 is an embodiment of circuit of placing permanent magnet type multi-phase independent dynamo and generator set.

25 Fig. 8 is an graphic view of embodiment which possesses auxiliary chair.

Fig. 9 is an graphic view of embodiment which possesses auxiliary chair and accumulator.

30

Fig. 10 is the embodiment of structure which has single set without accumulator.

5 Fig. 11 is a circuit diagram of self-generating and driving reaction training device which possesses double functional fly wheel for stabilization and damping.

10 Fig. 12 is an embodiment of circuit of self-generating and driving reaction training device which possesses double functional fly wheel for stabilization and damping.

15 Fig. 13 is a structural graphic view of embodiment which possesses double driving and common reaction training device.

Fig. 14 is a perspective view of five-axle double driving and transfer adjusting structure.

20 Fig. 14-1, 14-2 are the graphic views of five-axle double driving and transfer adjusting structure.

Fig. 14-3, 14-4 are the graphic views of five-axle double driving and transfer adjusting procedure.

25 Fig. 15 is a perspective view of five-axle double driving and swingable adjusting structure.

Fig. 15-1, 15-2 are the graphic views of five-axle double driving and swingable adjusting structure.

Fig. 16 is a perspective view of double driving tri-axle driving structure.

5 Fig. 16-1, 16-2 are the graphic view of double driving tri-axle driving structure.

Fig. 17, 17-2 is a graphic view of round thin plate cup-shaped fly wheel structure.

10 Fig. 18, 18-1 is a graphic view of seal ring structure.

Fig. 19 is the combination of hollow fly wheel.

15 Fig. 19-1 is a perspective view of hollow fly wheel.

Fig. 20 is the view showing an example of the utilization of the physical exercising tread mill with self-power-generating vibration-type massager.

20 Fig. 20-1 is the structural view of Fig. 1.

Fig. 21 is the view showing the example of the utilization of the ac-generator driven magnetic vibration-type massager.

25 Fig. 22 is the view showing the example of the utilization of the dc-generator driven series vibration-type contact point vibration-type massager.

30 Fig. 23 is the structural view of the mechanical pump-powered massager.

DETAILED DESCRIPTION OF THE INVENTION:

5 The present invention relates to a reclining and sitting active passive gymnastic equipment, especially it is used for muscle reaction, active pedalling, passive rehabilitation, and reaction training.

10 Accordingly, conventional exercise bike is simply pedalled by damping wheel and assemble single chair on the supporting rod, supporting rod is inserted into cylindrical supporting axial tube with larger diameter and is only used to adjust the height of position for the pedalling motion insitting.

15 The design of the present invention is that the height of chair and distance between chair and handle can be adjusted for the selection of reclining and sitting, and can provide active pedalling, and passive driven and can pull muscle of leg and possess function of active and passive training or rehabilitation, and traditional exercise bikes only
20 possess single chair and can not let the second one to join in the activity, it is lack of entertainment and can not make reaction training in pedalling, therefore, it becomes a bore thing for a long time and cause low using rate, but the present invention can make exercise of limbs
25 and reaction training, it is full of interest and can harmonize the motor nerve and further possess auxiliary chair for the second one to join in the exercise and can promote the human relation, rehabilitation, and reaction training and let brain and body exercise in the same time,
30 seat is easy to be adjusted.

Main character of the present invention is that the present invention is constituted by a set of stationary main body of bike frame on which there is a reclining and sitting chair, frictional fly wheel which is used to produce damping, dynamotor set which is coupled by pedal driving element in order to produce electric power and to be used as driving source, manual operational reaction training device, and auxiliary chair which is provided for the second one to join in and can promote entertainment of exerciser.

Accompanying with the drawings the preferred embodiments of the present invention are described as follows:

As shown in Figs. 1 and 2, it is the embodiment of reclining and sitting, active and passive exercise bike of the present invention which includes a set of bike frame main body which is stationed on the ground, and said bike frame main body possesses main bar 1-1 and sub-bar 1-2, said sub-bar 1-2 is fixed and jointed on the main bar 1-1, and is used to support main bar 1-1 and seat 2, and is screwed by screw on the handle bar 3 of main bar 1-1; manual operational reaction training device 4 is fixed on handle bar 3, and a set of pedal driving element which is pivoted by driving axle 5-4 and ball bearing 5-5 on bike frame main body, and said pedal driving element possesses drive chain wheel 5-1, driven chain wheel 5-2, chain 5-3 which is used to drive above two chain wheels 5-1, 5-2 and pedal 5-6 and crank set 5-6' wherein driven chain wheel 5-2 is pivoted by a

damping fly wheel 5-7, damping belt 5-8 or damping friction gear in order to produce frictional damping, and an accumulator, and said accumulator can accumulate electric power through pedalling the pedal driving element and dynamotor set 6-1 which is coupled by the damping fly wheel, and supply power to manual operational reaction training device, and when user makes passive exercise, said accumulator can supply electric power to said dynamotor set, and drive the pedal driving element for exerciser to make passive exercise; and a decorative plate 7 is screwed by screw on main bar 1-1 in order to cover pedal driving element; one end of a set of seat supporting rod 2-1 is pinned by the fixing pin 2-2 at one end of slightly inclined main bar 1-2, position of chair seat 2 can be slid and adjusted to let user recline or sit more comfortable, therefore, the whole structure can make exercise use his brain and limbs together, to stimulate his reaction and strengthen his body.

As shown in Fig. 3 it is a circuit diagram of the present invention, 1 is dynamotro set, 2 is clockwise and counterclockwise rotary selective switch, 3 is function selective device, 4 is stable votage circuit, 5 is manual operational reaction training device, 6 is accumulator, 7 is control circuit, dynamotor set 1 is selected by function selective switch 3 and used as dynamo or generator, when dynamo is in work, accumulator 6 supplies electric power, control circuit 7 controls the output of dynamics of dynamo, and output of clockwise rotation is selected by clockwise and counterclockwise selective switch 2, and at this time,

accumulator 6 simultaneously supplies electric power to manual operational reaction training device 5; when generator is in work, mechanical power transmitted from outside can let dynamo generate and produce stable output through stable voltage circuit 4 for the use of manual operational reaction training device and is transmitted into accumulator for storage.

As shown in Fig. 4, it is an embodiment of placing common armature dynamotor set, 1 is dynamotor set, 2 is single-pole double-throw switch, 3 is selective switch, 4 is stable voltage circuit, 5 is manual operational reaction training device, 6 is accumulator, 7 is variable resistance, when switch 3 is placed at position a, driving element is place to produce mechanical power and let dynamotor set generate and store electrical power to accumulator and supply electric power to manual operational reaction training device 5; in the same way, when switch 3 is placed at position b, accumulator supply electrical power to dynamotor set to let dynamotor set rotate and work, and it is used as dynamo and can let said driving element carry operator to make passive exercise driving, and through the function of single-pole double-throw switch, when it is placed at positive direction, then dynamo will carry the driving element to rotate in the positive direction, and exercise can make pulling exercise on leg muscle, when it is placed at reverse direction, then dynamo will carry the driving element to rotate in reverse, and exercise can make kicking exercise on leg muscle, variable resistance 7 is used to adjusted the strength of input electric power,

that is to adjust the output dynamics of dynamo and it is suitable for different age and different condition of health, under such circumstance, accumulator also supplies electric power to manual operational reaction training device; characters of circuit in Fig. 4 are:

- a set of armature DC common dynamotor set 1, two ends of armature are connected to two middle common joint of double-pole double-throw switch 2,
- after crossing and communicating two ends of double-throw switch 2, one end is connected to ground wire, one point is connected to the common joint of selective switch 3 (SWI);
- selective switch 3 (SWI) possesses OFF, a, b three position point,
- after reaction training device which is driven by electricity is connected in series by switch SW3, then it is connected by battery 6 in series, and negative end is grounded.
- diode D1 connected a resistance R1 in clockwise series from point a of selective switch 3 (SWI) to the positive end of battery;
- a variable resistance R1 is connected in clockwise series from positive end of battery to point b of selective switch 3 (SWI)

- stable voltage diode is connected in series by two ends of battery,

It operation is:

5

- when SWI is OFF, it is under stopping status;

10

- when SWI is at point a, dynamotor set 1 is driven in clockwise direction to produce electric power to accumulator or direct to load electricity, at this time, D1 is used to prevent the reverse current which is produced by pedalling in reverse, R1 and ZD, constitute stable voltage circuit, SW2 is used to select the direction of pedal;

15

- when SWI is at point b, battery can drive dynamotor set for exerciser to make passive motion, SW2 can select direction, variable resistance VR1 is used for varying speed.

20

As shown in Fig. 5, it is an embodiment of placing permanent magnet type two-phase step driving dynamotor set, 1 is permanent magnet type multi-phase dynamotor set, 2 is single-pole double-throw switch set, 3 is selective switch 4 is stable voltage circuit, 5 is manual operational reaction training device, 6 is accumulator, 7 is DC/AC converter; characters of circuit in Fig. 5 are:

25

- a set of two-phase step common dynamotor set 1 which possesses permanent magnet or rotor;

30

- after one end of two-phase coil connects diode D1 and D1' in clockwise direction, it is connected to one end of voltage drop resistance R1, and clockwise input end of diode D7;

5

- another wire of two-phase coil is connected to the crossing and connecting two ends of double-pole double-throw switch 2 (SW2);

10

- selective switch 3 (SW1) possesses a common joint and three output positions a, b, OFF:

- two clockwise input ends of diodes is commonly connected to point b of selective switch 3 (SW1);

15

- another end of R1 connects a stable voltage diode ZD, in parallel to positive end of battery;

- negative end of stable voltage diode ZD, is connected to point b of selective switch 3 (SW1)

20

- two output points of a DC/AC two-phase converter 7 connect diodes D5, D6 in clockwise series to two communicating points of SW2;

25

- output end of diode D7 and input grounding end of DC/A/C converter joint commonly to point a of selective switch 3 (SW1);

30

- input positive end of DC/AC converter 7 connects

separate diode D2 in series to the positive end of
battery;

5 - communicating point of selective switch SW, communi-
cates negative end of battery and negative end of elec-
trical driving training device;

10 - after positive end of manual operational reaction
training device connects switch SW1 in series, and
connects positive end of battery in parallel;

15 - when switch 3 is placed at position a, driving element
is pedalled to produce mechanical power and let dyna-
motor set generate and store electrical power to accu-
mulator and supply electricity to manual operations
reaction training device 5; in the same way, when
switch 3 is placed at position b, accumulator supplies
electrical power which is converted into AC by DC/AC
20 converter and let dynamotor rotate, and at this time
function of said dynamotor set is as same as dynamo,
due to the function of single-pole double-throw switch,
when it is placed at positive direction, then dynamo will
carry the driving element to rotate in the positive
25 direction, and exercise can make pulling exercise on leg
muscle; when it is placed at reverse direction, then
dynamo will carry the driving element to rotate in
reverse, and exercise can make kicking exercise on let
muscle, at this time - accumulator also supplies electric
30 power to manual operational reaction training device.

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As shown in Fig. 6, it is an embodiment of placing armature independent dynamo and generator set 1', its function is as shown in Fig. 4, and dynamo and generator are placed singly; characters of circuit in Fig. 6 are:

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- a DC armature in which two ends connect in parallel two input points of bridge rectification in order to make clockwise output through bridge rectification when it is pedalled in clockwise and counter clockwise direction;

10

- the positive pole output point of bridge rectification circuit which is constituted by diodes D1-D4 connects a voltage drop resistance R1 in series, negative pole is connected to grounding wire of circuit;

15

- positive end of stable voltage diode ZD, and one end of R1 commonly connect point b to selective switch 3 (SW1);

20

- selective switch 3 possesses a common joint and three output position points a, b, off;

25

- armature set of a set of dynamotor set connects two output ends which cross and communicate two ends of double-pole double-throw switch 2 (SW2);

30

- one end of two sets of common input end of double-throw switch 2 (SW2) is connected to the grounding wire, one point is connected to the grounding wire, one point is

connected by a variable resistance VR1 in series to point
a of selective switch 3 (SW1); negative end of electrical
driving training device is grounded by negative end of
battery in parallel, after positive input end connects a
5 switch SW3 in series and then connect positive end of
battery in positive end to common joint of selective switch;

Its operation is:

- 10 - when selective switch 3 (SW1) is off, machine is closed;
- when selective switch 3 (SW1) is placed at point a, electric
power drives the passive motion, current flows through
variable resistance VR1, double-throw switch SW2, and
15 armature, then flows back to negative pole through double-
throw switch SW2, variable resistance VR1 is used to control
speed, double-throw switch SW2 is used to control direction;
- when selective switch 3 (SW1) is placed at point a, it is
20 under active generating motion status, bridge rectification
is used to generate in clockwise and counter clockwise
driving, resistance R1 and stable voltage diode ZD is used
to prevent voltage to be too high.

25 As shown in Fig. 7, it is an embodiment of placing permanent
magnet type multi-phase independent dynamo 1 and independent
generator set 1', its function is shown in Fig. 5, and dynamo
and generator are singly placed; character of circuit in Fig.
7 is that permanent magnet A.C. generator is used to sub-
30 stitute for armature DC generator as shown in Fig. 6.

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As shown in Fig. 8, it is another embodiment of reclining and sitting, active passive exercise bike of the present invention, and its main characters are that an auxiliary chair is placed for the second one to participate in the activity, said auxiliary chair possesses " " shape supporting rod 8-1, auxiliary seta 8-2, pedal 8-3 and handle 8-4; auxiliary seat 8-2 can adjust and slide position along supporting rod 8-1, and it is fixed and screwed by screw for the second one to select position; and pedal 8-3 is fixed and screwed by screw on the supporting rod 8-1 which is between handle bar frame and auxiliary seat for the second one to sit comfortably.

Fig. 9 is another embodiment of the present invention in which besides an auxiliary chair, there also places an accumulator 6-5 for two exercisers to use the manual operational reaction training device.

Fig. 10 is the other embodiment of the present invention which possesses single set without accumulator to accumulate electric power.

As shown in Fig. 11, it is a circuit diagram of self-generating and driving reaction training device which possesses double functional fly wheel for stabilization and damping, 1 is dynamotor set, 4 is stable voltage circuit, 4' is rectifying circuit, 5 is manual operational reaction training device, when wheel is driven and carried dynamo 1 generate and pass through the function of rectifying circuit stable voltage circuit to supply stable electric power to manual

operational reaction training device.

5 As shown in Fig. 12, it is an embodiment of circuit of
self-generating and driving reaction training device which
possesses double functional fly wheel for stabilization and
damping, when user pedals the driving element, due to
damping function of fly wheel, it makes user must exhaust
energy to overcome the damping and obtain the effectiveness
of rehabilitation, and owing to the damping of fly wheel, it
10 makes voltage of dynamotor set be stably provided to manual
operational reaction training device.

As shown in Fig. 13, it is a structural graphic crew of
embodiment which possesses double driving and common reaction
15 training device, and the structure of above-mentioned double
driving device includes:

- on a bike frame main body, there are two sets of chair
12, 12' two sets of handle bar frame, and at least a set
20 of reaction training device 4.

- two sets of driving system which are coupled each other,
and its character is that two sets of driving pedal are
transmitted in the opposite direction and can commonly
25 drive the loaded damping or generator;

- driving gear set of chain wheel;

- a set of concentric swing type adjuster to adjust the
30 loose and tight condition between element of driving

- at least a set of damping device;
- at least a set of dynamotor set used for producing electric power or used as element for driving dynamics.

5

Figs. 14, 14-2 are the embodiments of this design, in figures, bike frame main body is a stationary frame, at two sides, there is a support rack for supporting chairs in the middle of bike frame, there are two sets of handle bar, between handle bar and bike frame main body, it can be jointed by common strut, or they respectively possess strut to joint bike frame main body; two set of pedal 200, 200' are respectively placed on the drive chain wheel axles 201, 201' at two ends of bike frame main body, two drive chain wheels 221, 221' drives two driven chain wheels 222, 222' by chains 203, 203' two driven chain wheels which are coupled each other by gear sets 22, 226; at least damping fly wheel 207 is placed on driven chain axle 208 in order to supply the damping required in motion; a set of concentric swing type adjuster possesses two concentric opening groove hole 206 and joints axle rod 211 which is at two ends of bike frame with thread and is used for adjusting and fixing with screw nut, at swing device, there is a set of fixed and driven chain wheel axle 208 and a set of are groove 209 which can adjust chain wheel by centering fixed and driven chain axle 208, this groove can be opened or sealed for penetrating a swingable adjusting axle 210 which possesses threads at two ends and can penetrate driving gear and is used for adjusting the looseness and tightness of chain, as shown in Figs. 14-3, 14-4; on the bike frame, there is

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friction belt type friction gear for adjusting the
damping and there further assembled a set of manual
operational reaction training device, and dynamotor set
which can supply driving power when it is used to produce
5 electric power or transmit electric power passively, and its
further characters is that in driving system, driven chain
wheel axle with at least one direction possesses one-way
bearing; and one of set of driven chain axle A possesses
one-way driving bearing, between two input wheels, from
10 A to B it makes dual driving; driven chain wheel axle B
makes one-way driving to A, or both of two sets of driven
chain wheel axle A, B possess one-way driving bearing in
same direction, between input chain wheel axles A, B it
can only make one-way mutual driving, if two sets of
15 driven chain axle possess one-way bearing in different
direction, and both of them are directly driven, wheel
axles A, B may make dual driving each other.

Figs. 15, 15-2 are another embodiment of above adjusting
20 structure, characters of structure are:

- a set of co-axial adjusting axle 210 which is penetrated
by driving wheel 225 and driving chain wheel 224 and its
two ends possesses threads, and is fixed and screwed by
25 screw nut in the adjusting groove 217 on bike frame;
- at two sides of adjusting axle 210, there placed a pair
of swingable branch handle 213, another end of branch
handl3 213, there is axle hole which is used to place
30 driven chain wheel axle 208, and at same set, there placed

driving gear 226 coupled by gear 225, and chain wheel
222 which is coupled by chain wheel 221;

- at two sides of coaxial driven chain wheel axle 208,
5 there placed a pair of branch handle 214 for adjustment,
another end of branch handle 214, there possesses an axial
rod 215, axial rod possesses threads and is placed in the
adjusting groove 216 on bike frame, and is fixed, locked and
adjusted by screw nut.

10

Above-mentioned mutual driving is used for rehabilitated people
or the passive exerciser is under driven status, active driver
pedals the pedal actively, and leg muscle of the rehabilitated
people or passive exerciser is exercised through loose passive
15 joint exercise, and its function is as same as rehabilitation
massage of bending joint, and arm can swing forward and
backward matching with rhythm and can further have the effec-
tiveness of rehabilitation.

20

Figs. 16, 16-2 are embodiment of tri-axle structure, wherein,
a set of drive axle is jointed by a drive gear 401 and driven
gear 402, at driven axle 403, there is chain wheel 404 to
couple with chain wheel 405 of drive axle 406 and constitute
tri-axle double drive and driven structure, and its main

25

structure is as same as above embodiment, but its structure
of adjusting device is centered by gear axles is used as radius
to form an opening or sealed type semi-circular groove 407 for
penetrating and placing driven gear and driven chain wheel
common axle rod 403 for adjusting the looseness and tightness
30 of chain of another axle 406, two ends of common axle rod 403

also possess threads for fixing and locking; fly wheel type damping device or disc frictional damping device is placed on common axial rod.

- 5 In the above-mentioned each embodiment, damping fly wheel must possess larger inertial in order to reduce the pulse of speed which is caused by the decrement of damping and it can be reached by the traditional solid fly wheel. Now in the market, usually, it is made of 10-20 kgs cast iron,
- 10 its cost is about $\frac{1}{4}$ of total cost, the further design of present invention is the improvement of damping fly wheel, and its character is that it is a hollow wheel which is pressed by metal plate and is filled by low cost concretion, i.e. concrete or water to provide a low cost fly wheel, its
- 15 constitutive characters include:
- as shown in Figs. 17, 17-2, two sets of fly wheel hub 301 which is round metallic thin plate cup-shaped structure, at its middle part, there is fixing hole 302 which possesses concave ring edge, outer ring is ladder type structure
 - 20 with smaller diameter near joining surface;
 - as shown in Figs. 18, 18-1, a set of ring type seal ring 304 which is made of rubber or other soft flexible material
 - 25 and is placed between above two cup type structure;
 - sides of above two cup-shaped structures possess concave and convex pattern surface which is used to fix concrete or in it there possesses metallic strip which is fixed
 - 30 and placed at rib of fly wheel hub.

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- Figs. 19, 19-1, are the combination and perspective view of the kind of fly wheel, the merit of this design is to lower down 40% costs of fly wheel.

5 Fig. 20 is an example of the utilization of the a physical
exercising tread mill attached with a power generator to be
driven by its fly wheel and comprising a magnetic vibration-
type massager; Fig. 20-1 is its structural view, 1001-
tread mill body; 1002-drive wheel, 1003-pedal board, 1004-
10 seat, 1005-handle bar, 1006-driven wheel, 1007-transmission
chain, 1008-front axle, 1009-rear axle, 1010-initially wheel,
1011-damp wheel, 1012-power generator, 1013-transmission wheel
conductor wire, 1014-output receptacle, 1015-magnetic vibra-
15 tion-type massager, 1016-conductor wire, 1017-plug, 1018-front
bearing, 1019-rear bearing, 1020-protective soft outer layer,
1021-fluid, 1022-vibration iron plate, 1023-buckle ring, 1024-
buckle hook, 1025-iron core, 1026-coil; the action is that
when the exerciser adjusts said damp wheel 1011 well,
sits on said seat 1004, grips said handle bar 1005 and pedals
20 said pedal board 1003, said drive wheel 1002 drives said
driven wheel 1006 and inertial fly wheel 1010 via said
transmission chain 1007 then drives said power generator 1012
couple to said inertial fly wheel 1010 to generate an electric
power, which is transmitted to said magnetic vibration-type
25 massager through said transmission conductor wire 1016 and
output plug receptacle 1014, and plug 1017 of magnetic vibra-
tion-type massager 1015 and conductor wire 1016, while said
massager 1015 has an enclosed fluid 1021 in its outside part
and also a vibration iron plate 1022 filled inside in addi-
30 tion to said vibration iron plates 1022 and iron core 1025

and coil 1026, when said coil is driven and attracts said iron plate 1022 to produce vibration actions which are then transmitted via said fluid to the user's flesh indirectly by said fluid, of course, said massager can be in a form of the grain-shaped one directly driven by the vibration iron plate without any transmission fluid, the combination of above-said generator unit and magnetic vibration-type massager includes:

- 10 - A DC generator is used to drive said magnetic vibration-type massager with an example of the utilization of its circuit shown in Fig. 21; or
- 15 - an AC or DC generator is used to drive the series vibration-type solid (such as transistor) or gate fluid or machinery-electric type contact point magnetic vibration-type massager; or any other vibration-type massagers driven the power supply generated by the pedaling of by the exerciser, and example of the utilization of its wiring is shown in Fig. 22.

Further, the functions of the above-said massager can be achieved by mechanical pump actions, as Fig. 23 is the view of such a design, in which a conventional pump device such as a rotary pump 3010 or reciprocating pump or eccentrically driven pump 3010' coupled to the drive structure produces pulse pump actions, the fluid transmission conduit 3012 joined by joints 3013 and 3014, to said massager 3011 and located between the pumps transmits the pulse power to said massager 3015, thus producing the vibrated massage functions, the outside appearance of said massager has at least, a

partial area in a sealed chamber shape constructed
by a flexible material and filled with a fluid inside,
and communicable to said fluid pump by a conduct and
a joint.

5

Summing up, the present invention provides an auxiliary
chair for the second one to join in the activity and
promotes interest of exercise and also possesses manual
operational reaction training device to use hands and
10 brain together, exerciser can pedal the pedal to make
active motion and passive training and rehabilitation, and
it is a reclining and sitting exercise bike which can
execute action of rehabilitation and training together;
besides the case makes the exerciser simultameously
15 accepting the vibrated massages on a proper part over his
body during his petaling movements, hereby ascertaining
a practical functional improvement.

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CLAIMS:

1. Double functional exercise bike for exercise and training includes:

- 5 - a set of bike frame main body 1 which possesses main bar 1-1 and sub-bar 1-2, said sub-bar 1-2 is jointed and fixed on main bar 1-1 to support main bar 1-1 and chair seat 2 and is screwed and placed on the handle bar 3 of main bar 1-1 by screw;
- 10 - manual operational reaction training device 4 which is placed and fixed on the handle bar 3;
- pedal driving element 5 is pivoted on bike frame main body 1 by driving axle 5-4 and ball bearing 5-5;
- pedal driving element 5 possesses drive chain wheel 5-1, driven chain wheel 5-2, and chain 5-3 and pedal 5-6 which
15 are used for drivint the above-mentioned two chain wheels;
- driven chain wheel 5-2 is pivoted by a damping fly wheel 5-7, damping belt 5-8 or damping friction gear in order to produce frictional damping;
- 20 - an accumulator 6, said accumulator 6 can accumulate electric power through pedalling the pedal driving element 5 and dynamotor set 6-1 which is pivoted by the damping fly wheel, and is used in manual operational reaction training device;
- accumulator can supply electric power to said dynamotor
25 set, and drive the pedal driving element 5;
- a decorative plate is screwed by screw on main bar 1-1 in order to cover pedal driving element 5;
- one end of a set of seat supporting rod 2-1 is pinned by the fixing pin 2-2 at one end of slightly inclined main bar
30 1-2, position of chair seat 2 can be slided adjusted along

main bar.

2. Double functional exercise bike for exercise and training includes the following equipment:

- dynamotor set 1;
- 5 ----- clockwise and counter clockwise rotary selective switch 2;
- function selective device 3;
- stable voltage circuit 4;
- manual operational reaction training device 5;
- 10 ----- accumulator 6;
- control circuit 7;
- dynamotor set 1 is selected by function selective switch 3 and used as dynamo or generator;
- if dynamo is in work, accumulator 6 supplies electric power, control circuit 7 controls the output of dy-
- 15 manics of dynamo, and output of clockwise and counter clockwise rotation is selected by clockwise and counterclockwise selective switch 5, and accumulator 6 simultaneously supplies electric power to manual
- 20 operational reaction training device 5;
- if generator is in work, mechanical power transmitted from outside can let dynamo generate and produce stable output through stable voltage circuit 4 for the use of manual operational reaction training device and is
- 25 transmitted into accumulator for storage.

3. Circuit equipment as claimed in claim 2 includes:

- armature common dynamotro set 1;
- single-pole double-throw switch 2;
- selective switch 3;
- 30 ----- stable voltage circuit 4;

----- manual operational reaction training device 5;

----- accumulator 6;

----- variable resistance 7;

the characters of circuit are:

- 5 - a set of amature D.C. common dynamotor set 1, two ends
of armature are connected to two middle common joint of
double-pole double-throw switch 2;
- 10 - after crossing and communicating two ends of double-
throw switch 2, one end is connected to ground wire, one
point is connected to the common joint of selective switch
3 (SW1);
- 15 - selective switch 3 (SW1) possesses off, a,b, three po-
sition point;
- after reaction training device 5 which is driven by ele-
ctricity is connected in series by switch SW3, then it is
connected by battery 6 in series, and negative end is grounded;
- 20 - diode D1 connected a resistance R1 in clockwise series
from point a of selective switch 3 (SW1) to the positive
end of battery;
- a variable resistance R1 is connected in clockwise series
from positive end of battery to point b of selective switch
3 (SW1);
- 25 - stable voltage diode is connected in series by two ends
of battery;
- its operation is:
- when SW1 is OFF, it is under stopping status:
- when SW1 is at point a, dynamotor set 1 is driven in
clockwise direction to produce electric power to accumu-
lator or direct to load electricity, at this time, D1 is
30 used to prevent the reverse current which is produced by

pedalling in reverse, R1 and ZD1 constitute stable voltage circuit, SW2 is used to select the direction of pedal;

- when SW1 is at point b, battery can drive dynamotor set for exerciser to make passive motion, SW2 can select direction, variable resistance VR1 is used for varying speed.

4. Circuit equipment as claimed in claim 2 includes:

-- Common permanent magnet type tow-phase step driving and generating common dynamotor set;

-- single-pole double-throw switch 2;

-- selective switch 3;

--stable voltage circuit 4;

--manual operational reaction training device 5;

-- accumulator 6;

-- DC/AC converter 7;

the characters of circuit are:

- a set of two-phase step common dynamotor set 1 which possesses permanent magnet or rotor;

- after one end of two-phase coil connects doide Da and D1' in clockwise direction, it is connected to one end of voltage drop resistance R1, and clockwise input end of diode D7;

- another wire of two-phase coil is connected to the crossing and connecting two ends of double-pole double-throw switch 2 (SW2);

- selective switch 3 (SW1) possesses a common joint and three output positions a,b, OFF;

- tow clockwise input ends of diodes is commonly connected to point b of selective switch 3 (SW1);

- another end of R1 connects a stable voltage diode ZD1 in parallel to positive end of battery;

- negative end of stable voltage diode ZD1 is connected to point b of selective switch 3 (SW1);
 - two output points of a DC/AC two-phase converter 7 connect diodes D5, D6 in clockwise series to two communicating points of SW2;
 - output end of diode D7 and input grounding end of DC/AC converter joint commonly to point a of selective switch 3 (SW1);
 - input positive end of DC/AC converter 7 connects separate diode D2 in series to the positive end of battery;
 - communicating point of selective switch SW1 communicates negative end of battery and negative end of electrical driving training device;
 - after positive end of manual operational reaction training device connects switch SW1 in series, and connects positive end of battery in parallel;
 - when switch 3 is placed at position a, driving element is pedalled to produce mechanical power and let dynamotor set generate and store electrical power to accumulator and supply electricity to manual operational reaction training device 5;
 - when switch 3 is placed at position b, accumulator supplies power which is converted into AC by DC/AC converter and let dynamotor rotate.
5. Circuit equipment as claimed in claim 2 includes armature type independent dynamo and generator set, its circuit characters are:-
- a DC armature in which two ends connect in parallel two input points of bridge rectification in order to make clockwise output through bridge rectification when it is pedalled

in clockwise and counter clockwise direction;

- the positive pole output point of bridge rectification circuit which is constituted by diodes D1-D4 connects a voltage drop resistance R1 in series, negative pole is connected to grounding wire of circuit;

- positive end of stable voltage diode ZD1 and one end of R1 commonly connect point b to selective switch 3 (SW1);

- selective switch 3 possesses a common joint and three output position points a,b, OFF;

- armature set of a set of dynamotor set connects two output ends which cross and commutate two ends of double-pole double-throw switch 2 (SW2);

- one end of two sets of common input end of double-throw switch 2 (SW2) is connected to the grounding wire, one point is connected by a variable resistance VR1 in series to point a of selective switch 3 (SW1);

- negative end of electrical driving training device is grounded by negative end of battery in parallel, after positive input end connects a switch SW3 in series, and then connect positive end of battery in positive end to common joint of selective switch; and its operation is:

- when selective switch 3 (SW1) is OFF, machine is closed;

- when selective switch 3 (SW1) is placed at point a, electric power drives the passive motion, current flows through

variable resistance VR1, double-throw switch SW2, and armature, then flows back to negative pole through double-throw switch SW2, variable resistance VR1 is used to control speed, double-throw switch SW2 is used to control direction;

- when selective switch 3 (SW1) is placed at point a, it is under active generating motion status, bridge rectification

is used to generate in clockwise and counterclockwise driving, resistance R1 and stable voltage diode ZD is used to prevent voltage to be too high.

5 6. Dynamotor set as claimed in claim 4 wherein permanent magnet type multi-phase independent dynamo 1 and independent generator set 1' is placed in it, and dynamo and generator are singly placed.

7. Dynamotor set as claimed in claim 5 is an A.C. generator with permanent magnet.

10 8. Double functional exercise bike for exercise and training as claimed in claim 1, and its main characters are:

- an auxiliary chair is placed for the second one to participate in the activity, said auxiliary chair possesses " " shape supporting rod 8-1, auxiliary seat 8-2, pedal 8-3 and handle 8-4;
- auxiliary seat 8-2 can adjust and slide position along supporting rod 8-1, and it is screwed and fixed by screw for selecting position;
- pedal 8-3 is fixed and screwed by screw on the supporting rod 8-1 which is between handle bar frame and auxiliary seat.

25 9. Double functional exercise bike for exercise and training as claimed in claim 1, wherein an auxiliary chair and an accumulator 6-5 are provided for two exercisers to use the manual operational reaction training device.

10. Double functional exercise bike for exercise and training as claimed in claim 1, possesses single set without accumulator to accumulate electric power.

30 11. Double functional exercise bike for exercise and training as claimed in claim 1, possesses:

- fly wheel for stabilization and damping;
- dynamotor set 1;
- clockwise and counter clockwise selective circuit 2;
- stable voltage circuit 4;

5 - manual operational reaction training device 5.

12. Double function exercise bike for exercise and training possesses structure of double driving and common reaction training device, and this structure includes:

- 10 - on a bike frame main body, there are two sets of chair 12, 12', two sets of handle bar frame, and at least a set of reaction training device 4,
- two sets of driving system which are coupled each other, and its character is that two sets of driving pedal are
- 15 transmitted in the opposite direction and can commonly drive the loaded damping or generator;
- driving gear set of chain wheel;
- a set of concentric swing type adjuster to adjust the loose and tight condition between element of driving system;
- 20 - at least a set of damping device;
- at least a set of dynamotor set used for producing electric power or used as element for driving dynamics.

13. Structure as claimed in claim 12 wherein characters of structure are:

- 25 - bike frame main body is a stationary frame, at two sides, there is a support rack for supporting chair;
- in the middles of bike frame, there are two sets of handle bar, between handle bar and bike frame main body, it can be jointed by common strut, or they respectively possess strut
- 30 to joint bike frame main body;

- two sets of pedal 200, 200' are respectively placed on the drive chain wheel axles 201, 201' at two ends of bike frame main body;
- two drive chain wheels 221, 221' drives two driven chain wheels 222, 222' by chains 203, 203';
- two driven chain wheels which are coupled each other by gear sets 225, 226;
- at least damping fly wheel 207 is placed on driven chain axle 208';
- a set of concentric swing type adjuster possesses two concentric opening groove hole 206 and joints axle rod 211 which is at two ends of bike frame with thread and is used for adjusting and fixing with screw nut;
- at swing device, there is a set of fixed and driven chain wheel axle 208 and a set of are groove 209 which can adjust chain wheel by centering fixed and driven chain axle 208, this groove can be opened a sealed for penetrating a swingable adjusting axle 210 which possesses threads at two ends and can penetrate driving gear and is used for adjusting the looseness and tightness of chain;
- in driving system, driven chain wheel axle with at least one direction possesses one-way bearing;
- one of sets of driven chain axle A possesses one-way driving, driven chain wheel axle B makes one-way driving to A.
- both of sets of driven chain wheel axle A,B, possess one-way driving bearing in same direction, between input chain wheel axles A,B, it can only make one-way mutual driving;
- two sets of driven chain axle possess one-way bearing in different direction, and both of them are directly driven, wheel axles A,B may make dual driving each other.

14. Adjusting structure as claimed in claim 13, wherein its characters are:

- a set of co-axial adjusting axle 210 which is penetrated by driving wheel 225 and driving chain wheel 224 and its two ends possesses threads, and is fixed and screwed by screw nut in the adjusting groove 217 on bike frame;
- at two sides of adjusting axle 210, there placed a pair of swingable branch handle 213, another end of branch handle 213, there is axle hole which is used to place driven chain wheel axle 208, and at same set, there placed driving gear 226 coupled by gear 225, and chain wheel 222 which is coupled by chain wheel 221;
- at two sides of coaxial driven chain wheel axle 208, there placed a pair of branch handle 214 for adjustment, another end of branch handle 214, there possesses an axial rod 215, axial rod possesses threads and is placed in the adjusting groove 216 on bike frame, and is fixed, locked and adjusted by screw nut.

15. Adjusting structure as claimed in claim 13:

- a set of drive axle is jointed by a drive gear 401 and driven gear 402;
- at driven axle 403, there is chain wheel 404 to couple with chain wheel 405 of drive axle 406;
- structure of adjusting device is centered by gear type input drive axle 400 and the distance of two gear axles is used as radius to form an opening or sealed type semi-circular groove 407 for penetrating and placing driven gear and driven chain wheel common axle rod 403 for adjusting the looseness and tightness of chain of another

axle 406;

- two ends of common axle rod 403 also possess threads for fixing and locking;

- fly wheel type damping device or disc frictional damping device is placed on common axle rod.

16. Dampint fly wheel as claimed in Claim 1, its character is that it is a hollow fly wheel which is pressed by metal plate and is filled by low cost concretion i.e. concrete or water to provide with a low cost fly wheel, its constitutive characters include:

10 - two sets of fly wheel hub 301 which is round metallic thin plate cup-shaped structure, at its middle part, there is fixing hole 302 which possesses concave ring edge, outer ring is ladder type structure with smaller diameter near joining surface;

- a set of ring type seal ring 304 which is made of rubber or other soft flexible material and is placed between above two cup type structures;

- sides of above two cup-shaped structures possess concave and convex pattern surface which is used to fix concrete or in it there possesses metallic strip which is fixed and placed at rib of fly wheel hub.

20 17. A physical fitness training tread mill with its feature lying in that it has a power generate to drive a vibration-type massage, comprising:

- an ac-generator-driven magnetic vibration-type massager; or

- a dc - or dc generator-driven series magnetic vibration-type

25 solid or machinery-electric contact point vibration-type massager, or other exerciser pedaled generator-driven vibration-type massager.

18 The physical fitness training tread mill as
recited in the above Claim 1 with second structure
comprising:

----- a rotary type or reciprocating type or
5 eccentrically driven type fluid pump driven by the
mechanism pedaled by an exerciser to conduct rotary
or reciprocating pulse pump actions;

----- a fluid conduit is located between said fluid
pump and massager filled with fluid inside to trans-
10 mit the vibration power.

----- The outside appearance of said massager has
at least, a partial area in a sealed chamber shape
constructed by a flexible material and filled with
a fluid inside, and communicable to said fluid pump
15 by a conduit and a joint.

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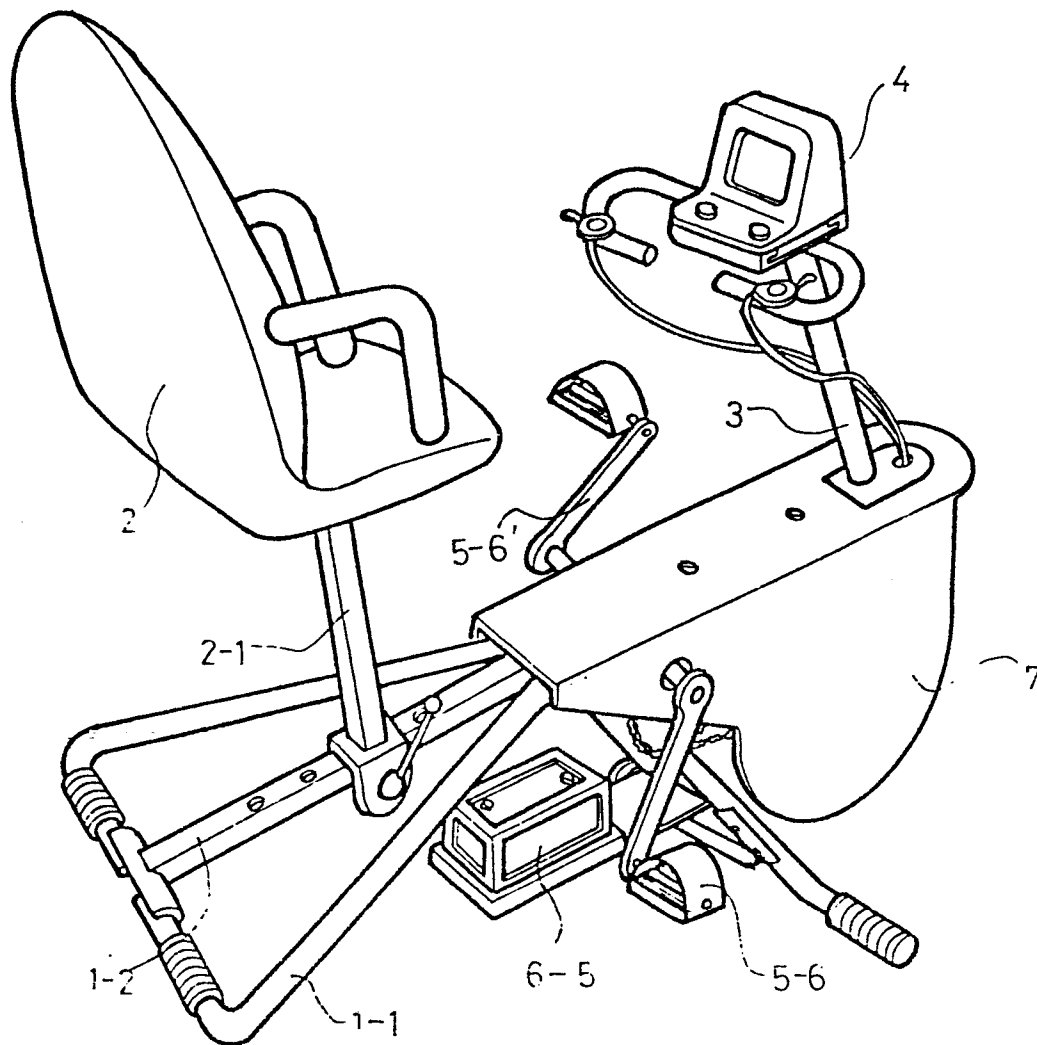
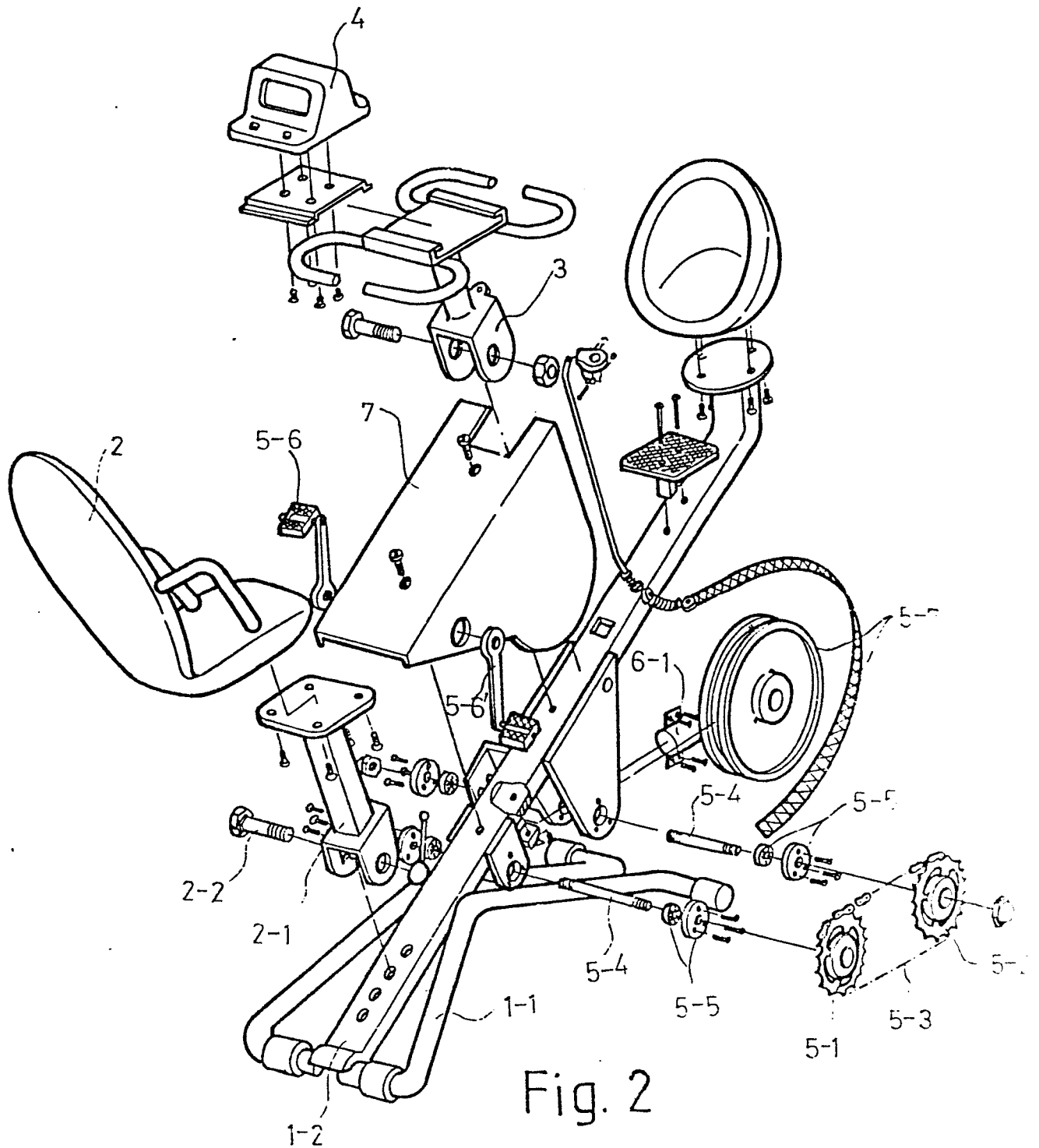


Fig. 1



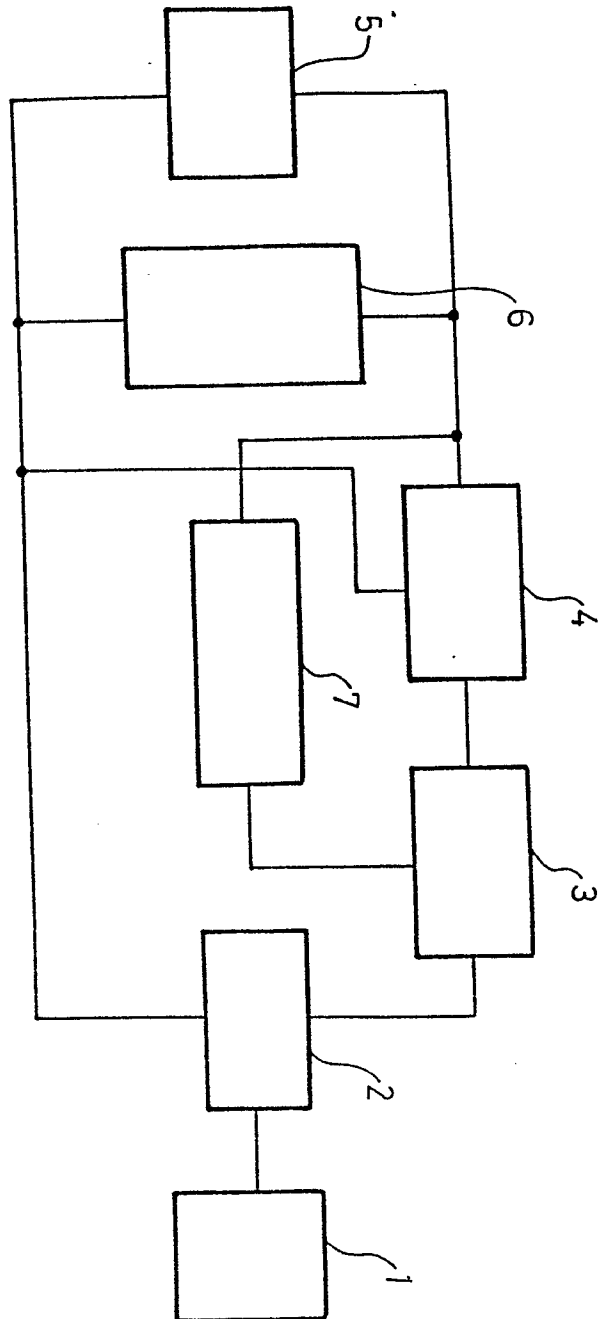


Fig. 3

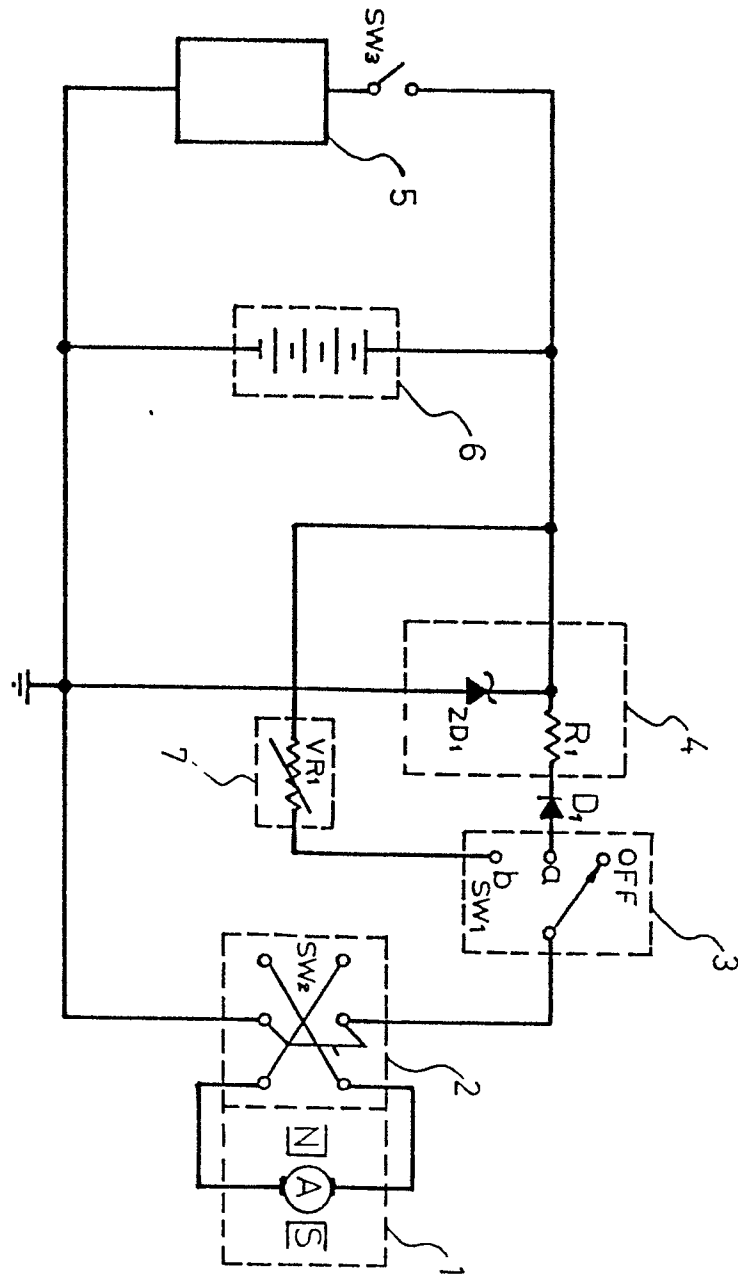


Fig. 4

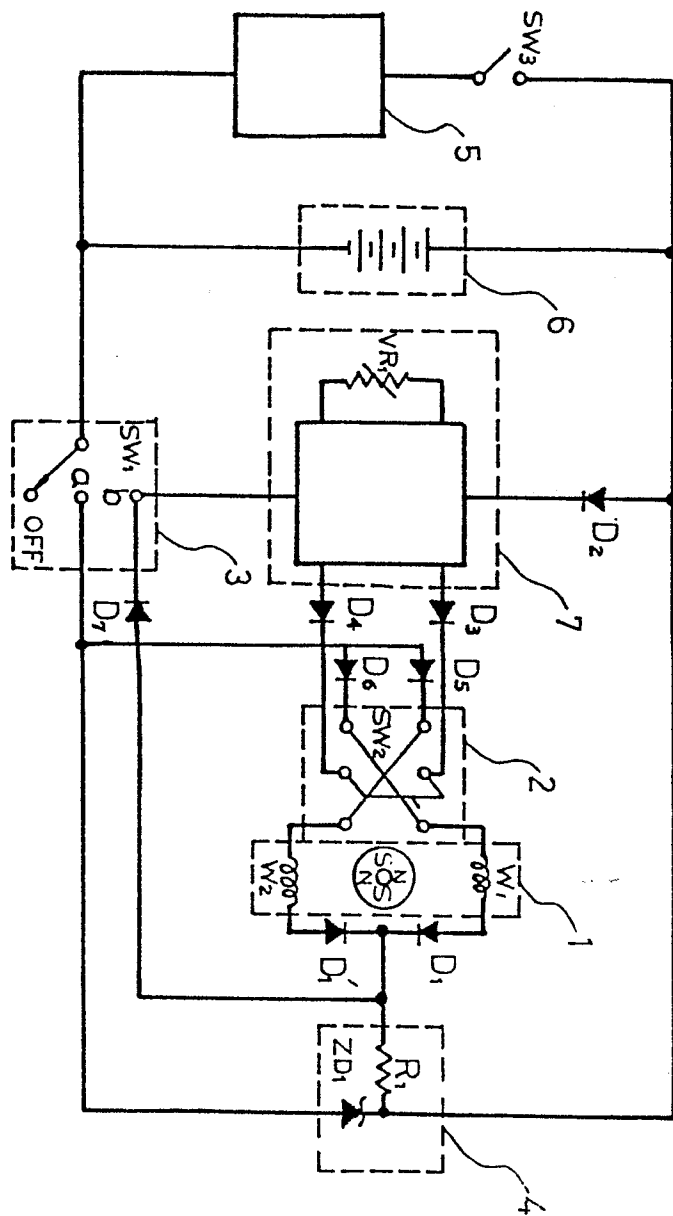


Fig. 5

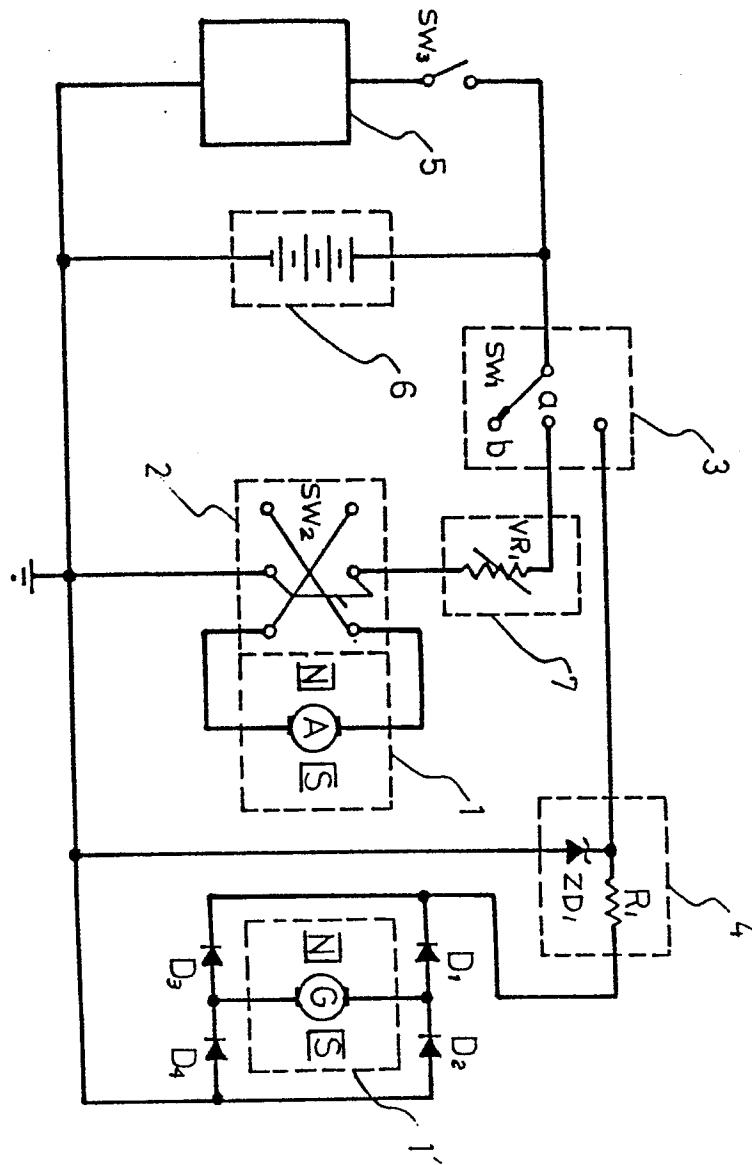


Fig. 6

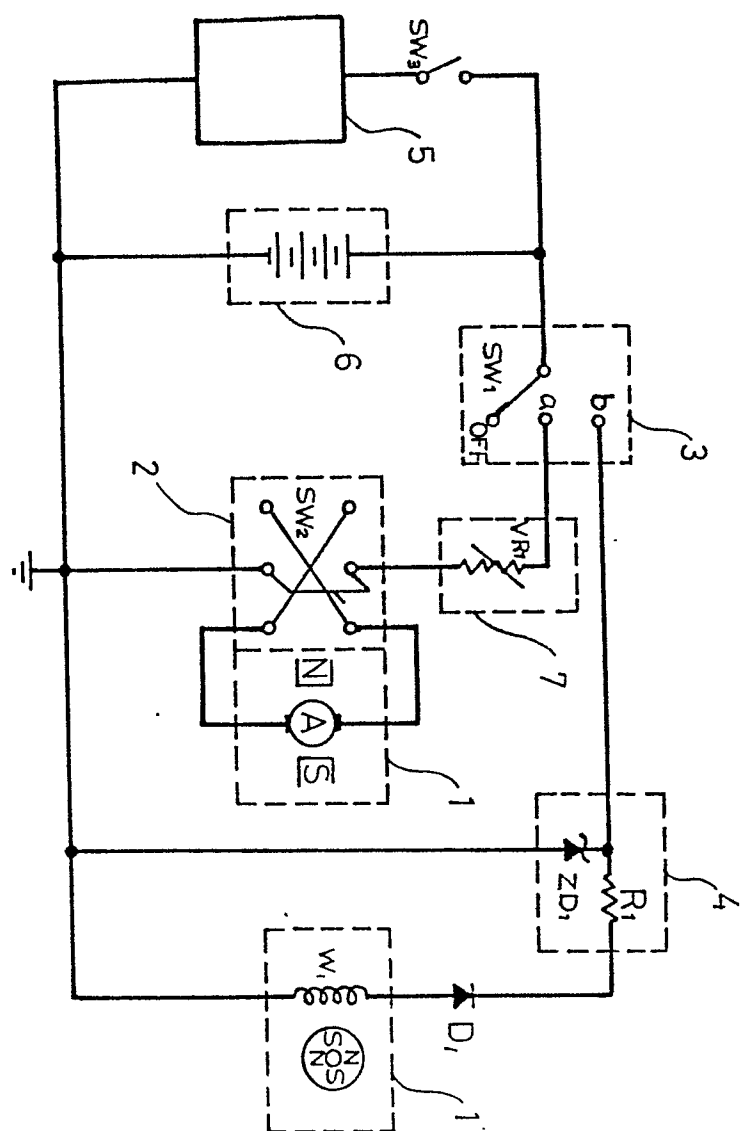


Fig. 7

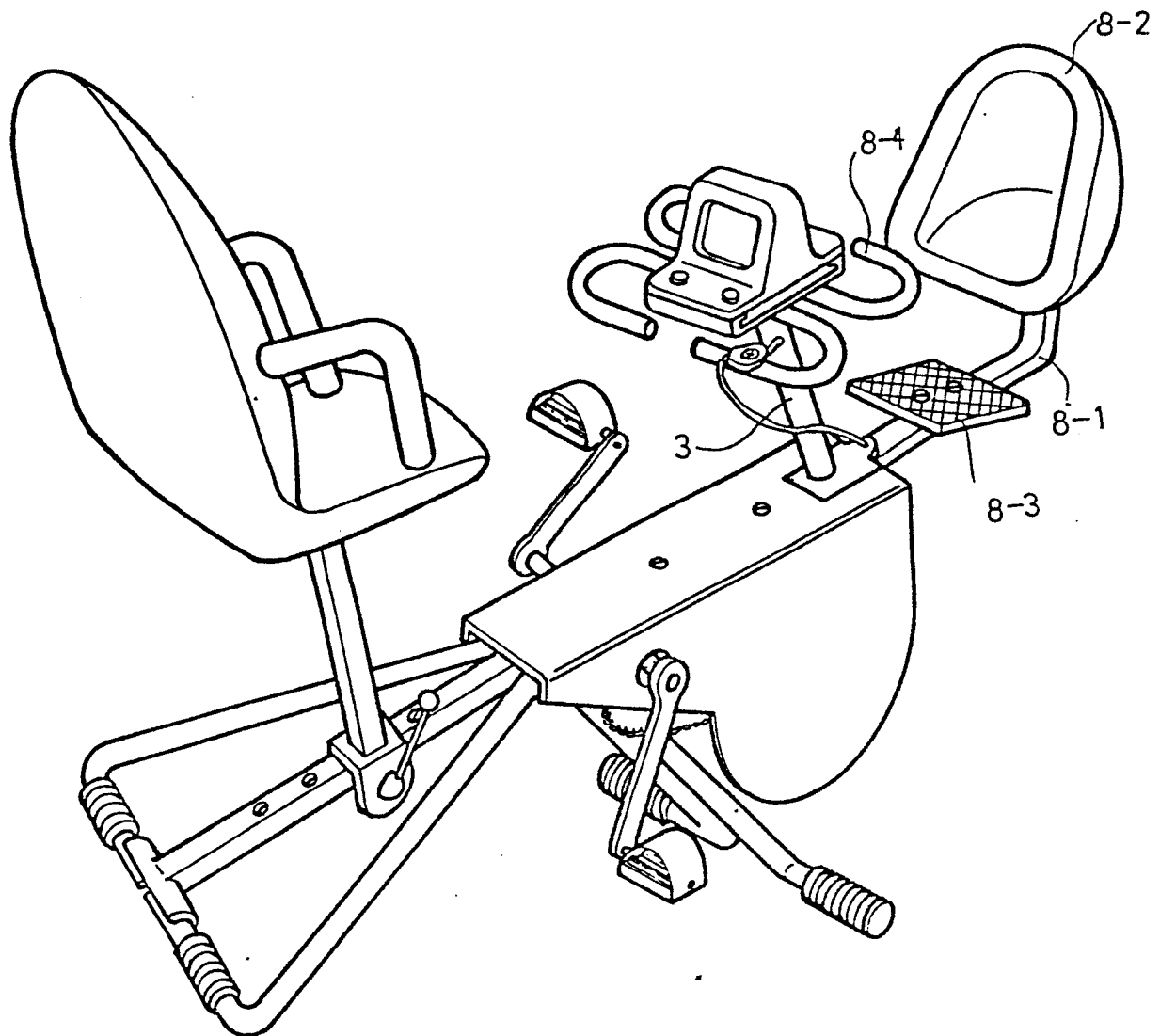


Fig. 8

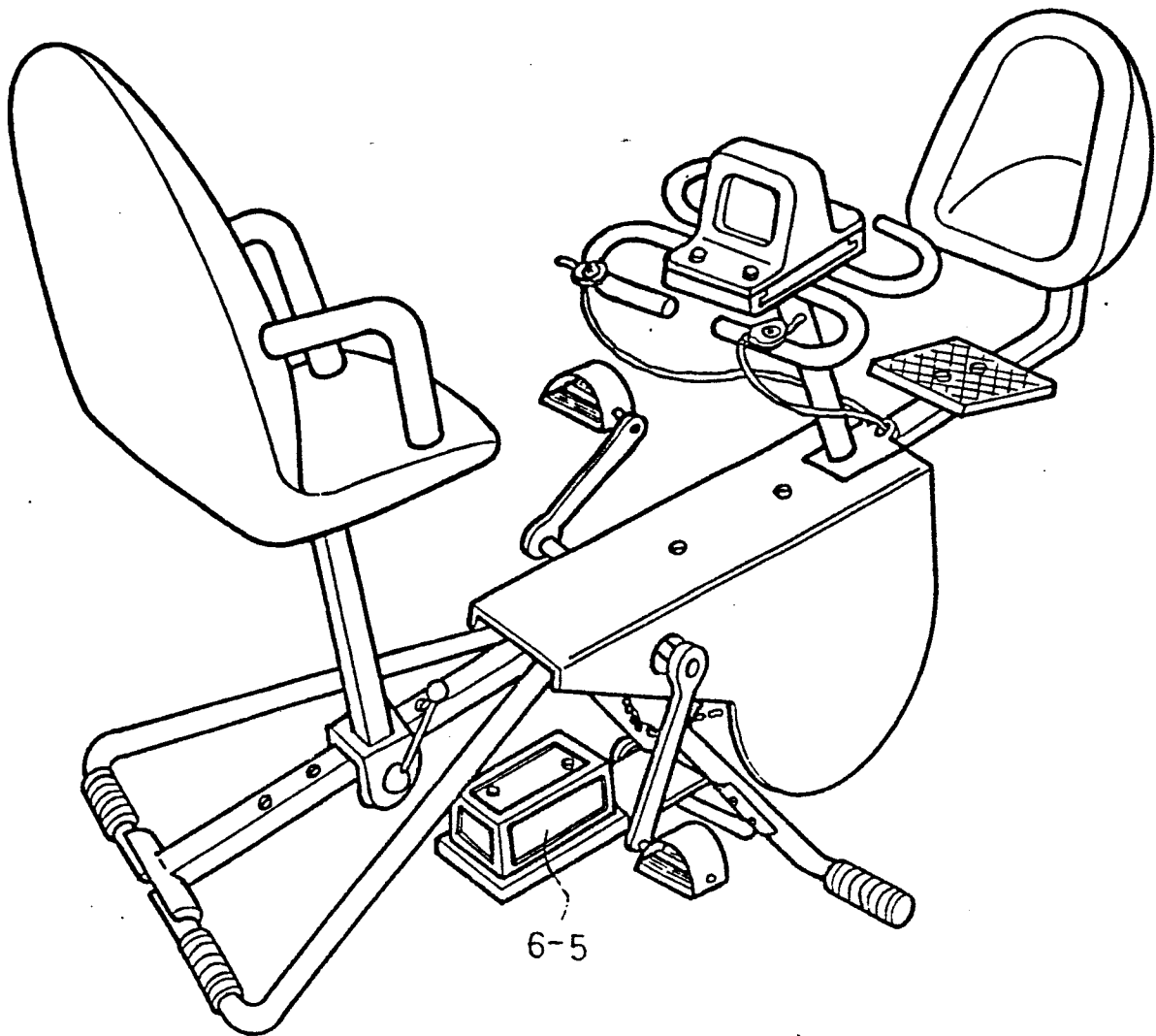


Fig. 9

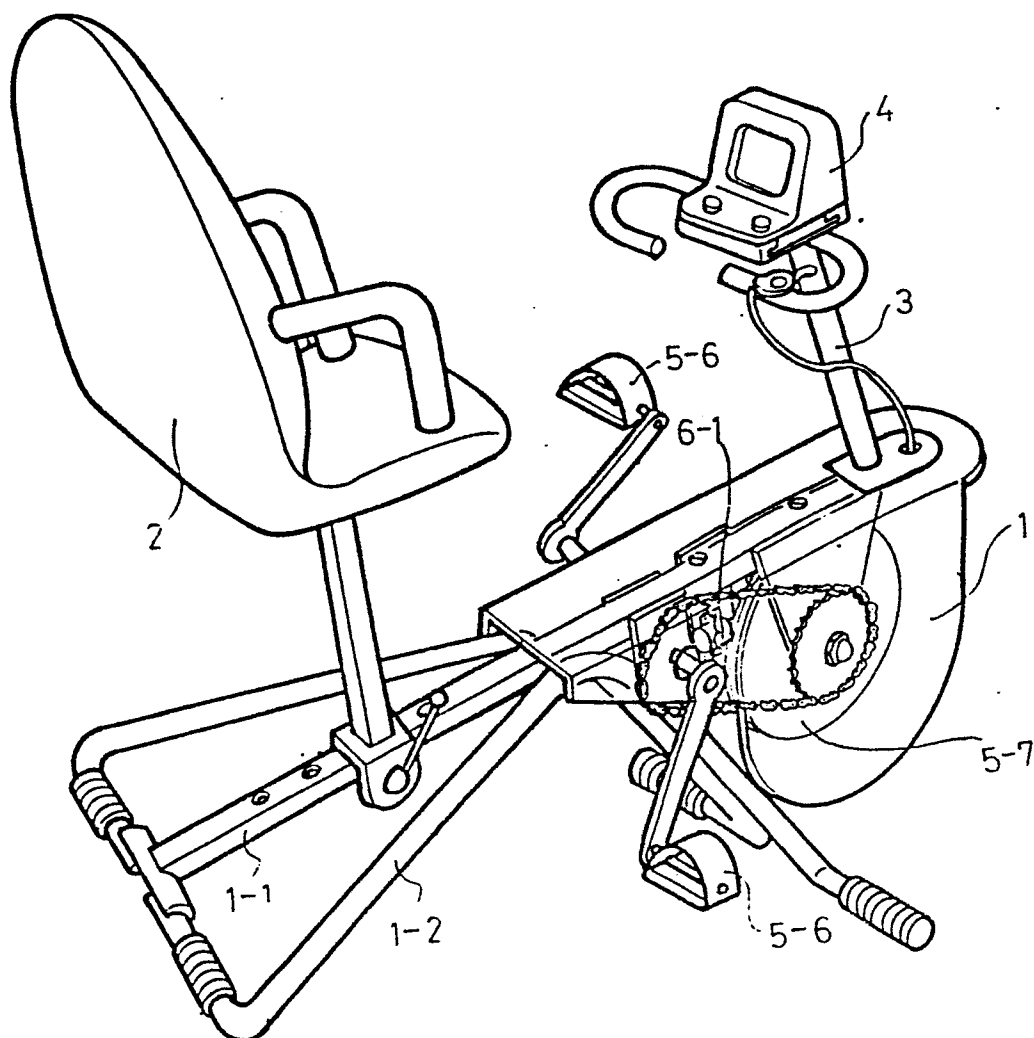


Fig. 10

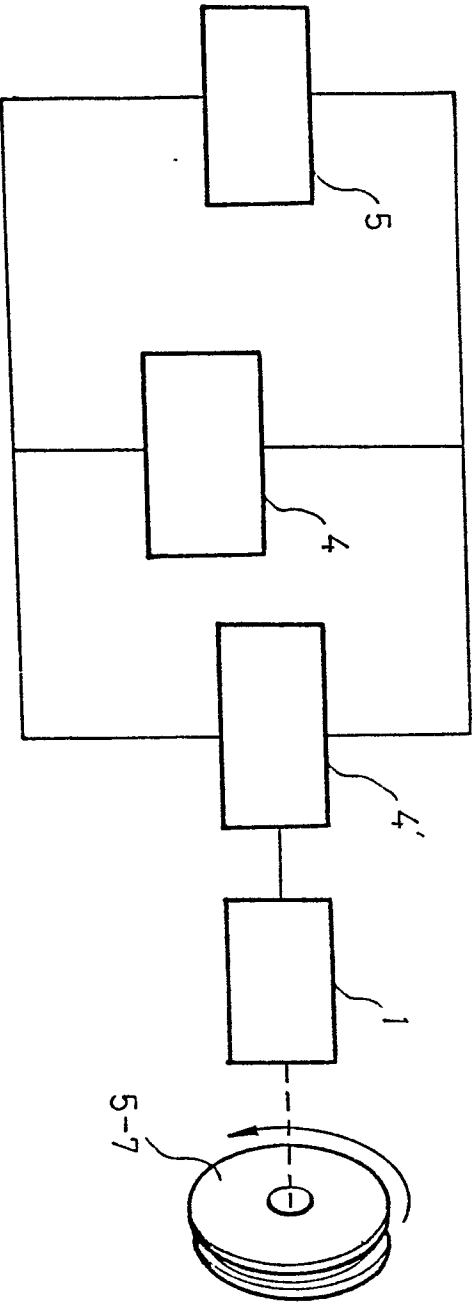


Fig. 11

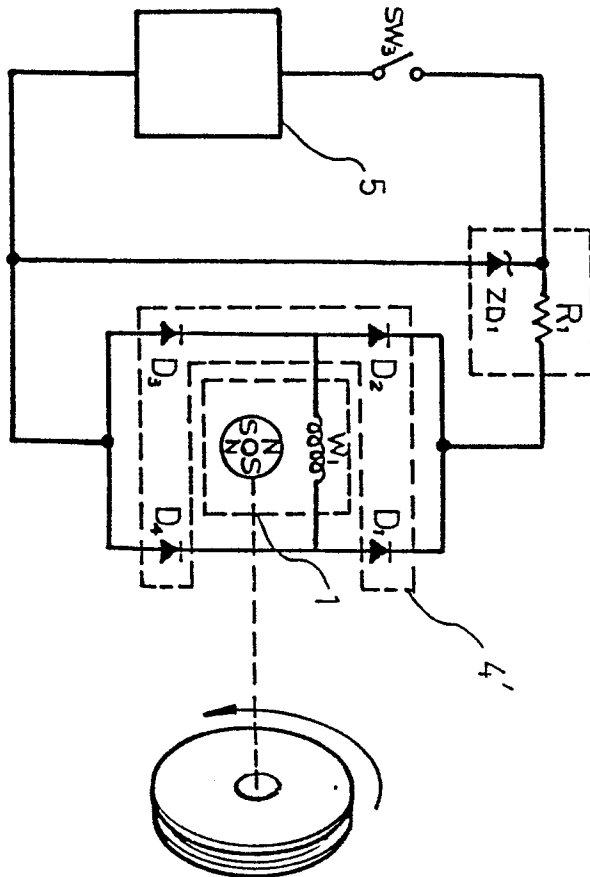


Fig. 12

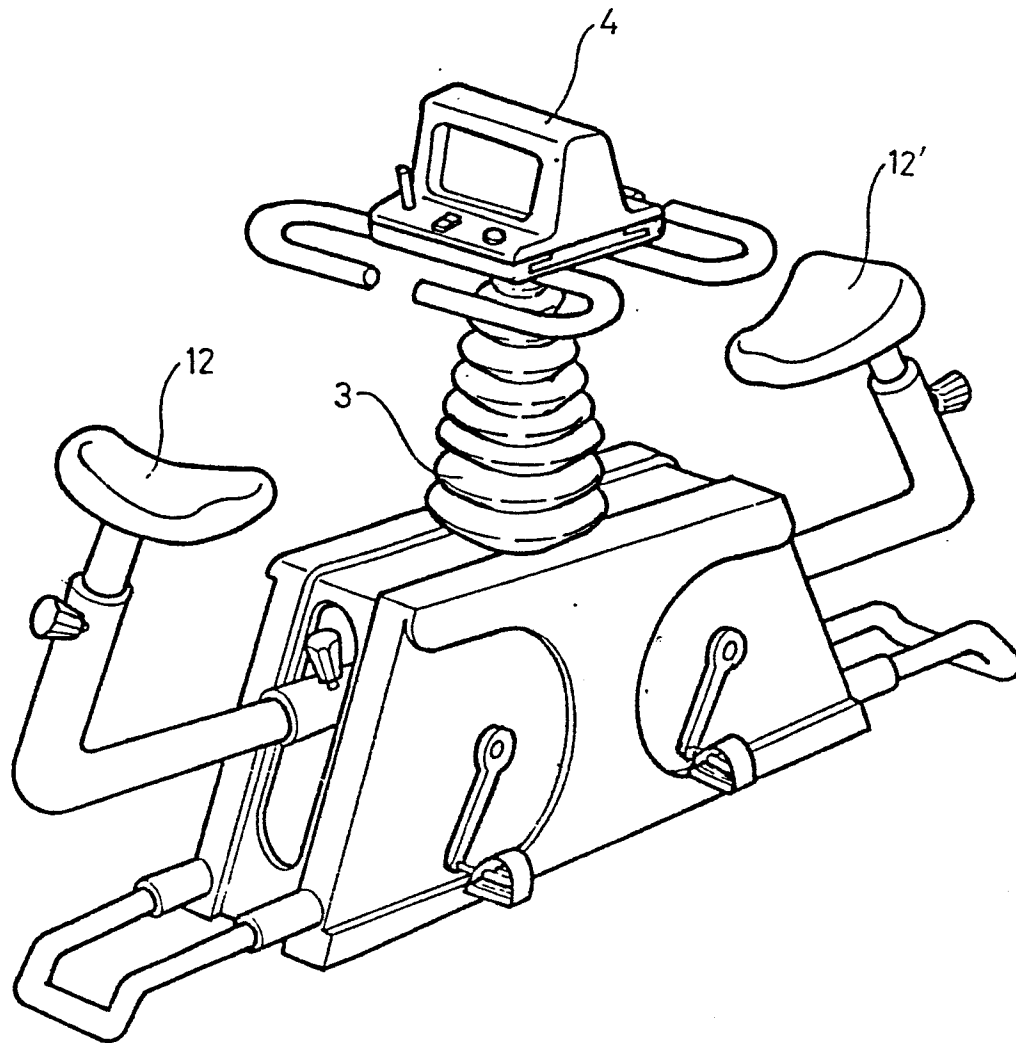


Fig. 13

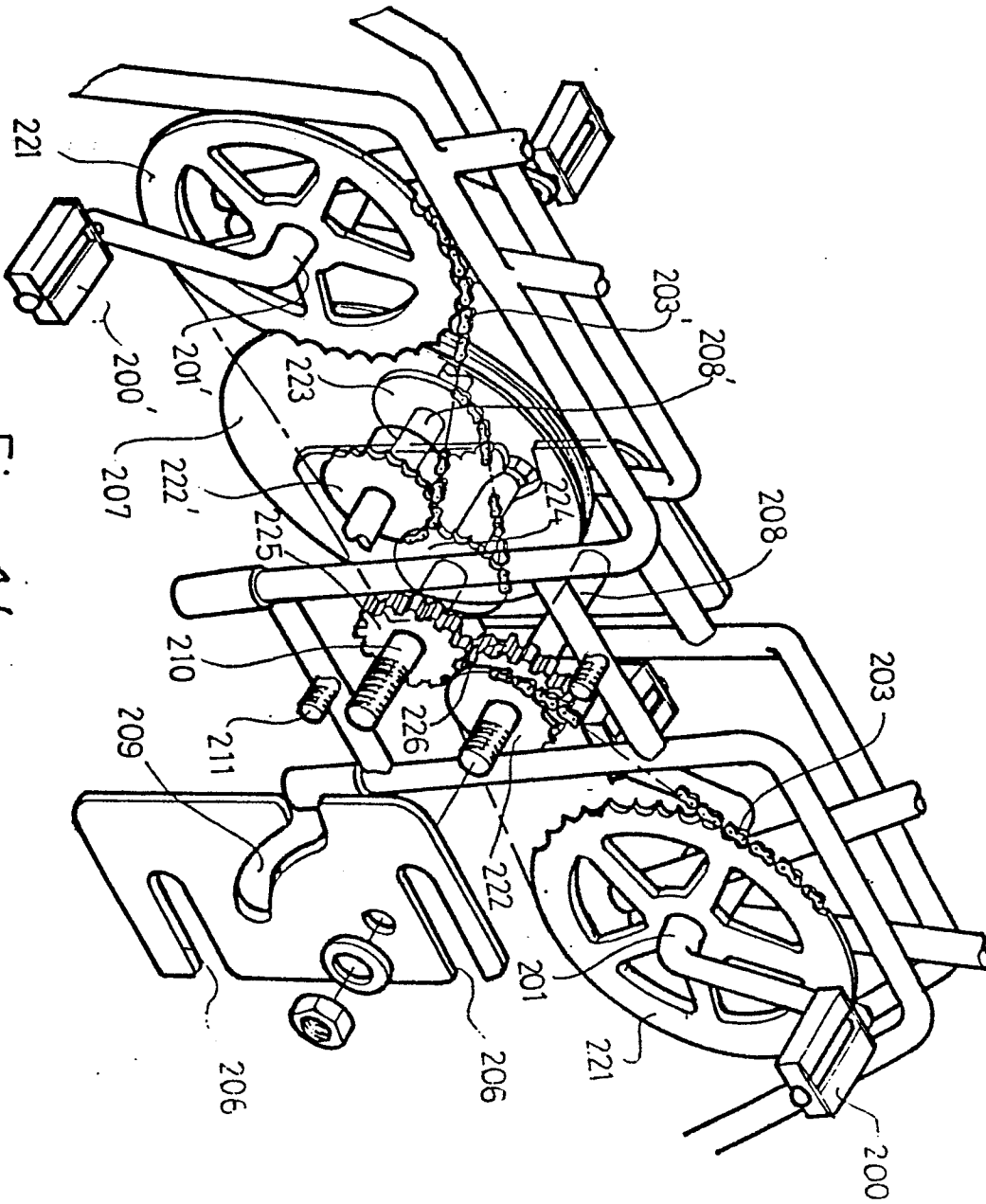


Fig. 14

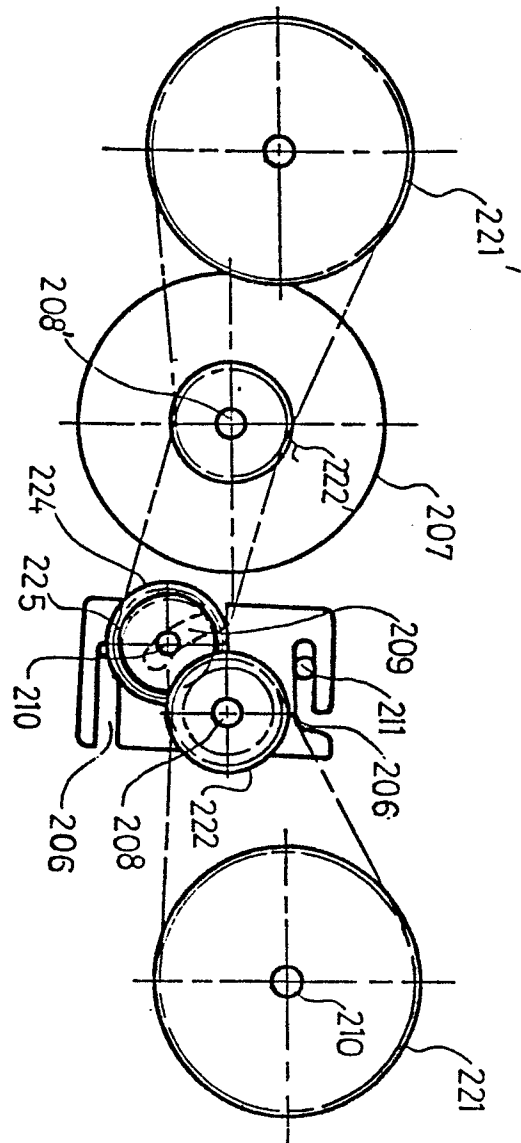


Fig. 14-1

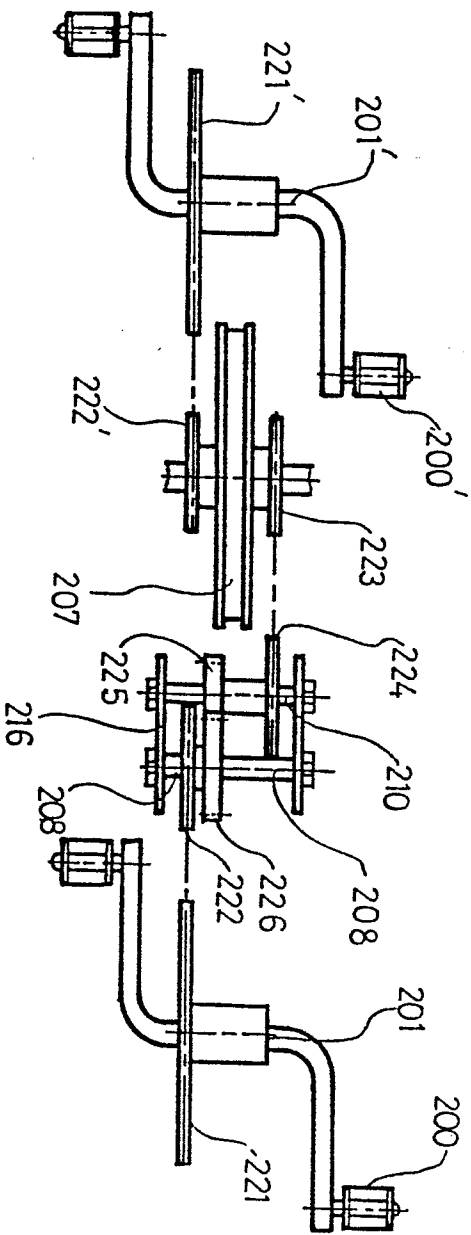
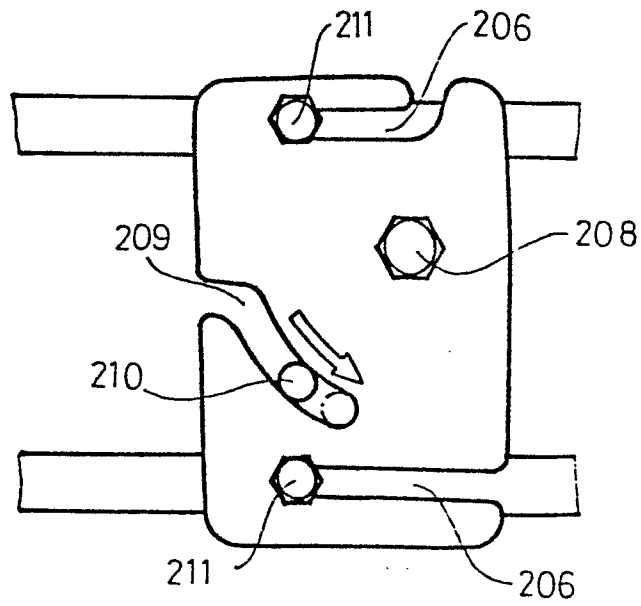
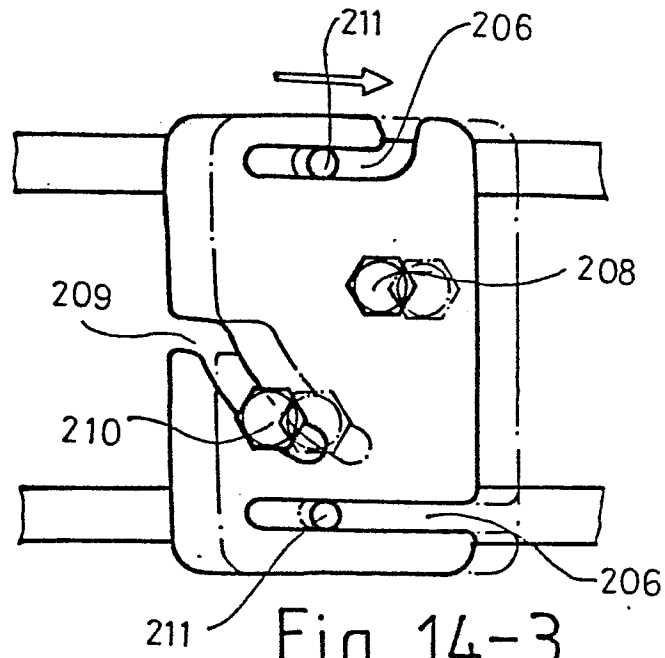
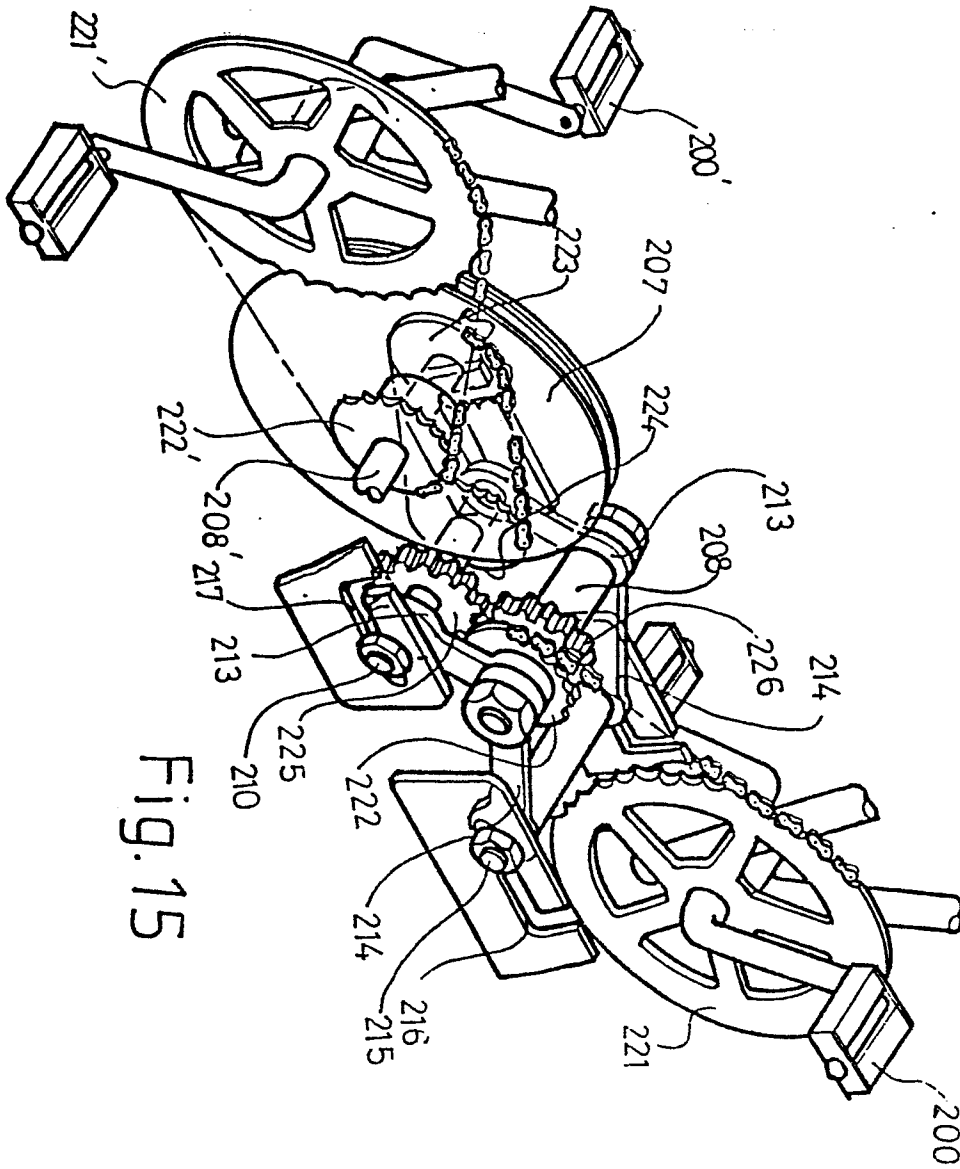


Fig. 14-2





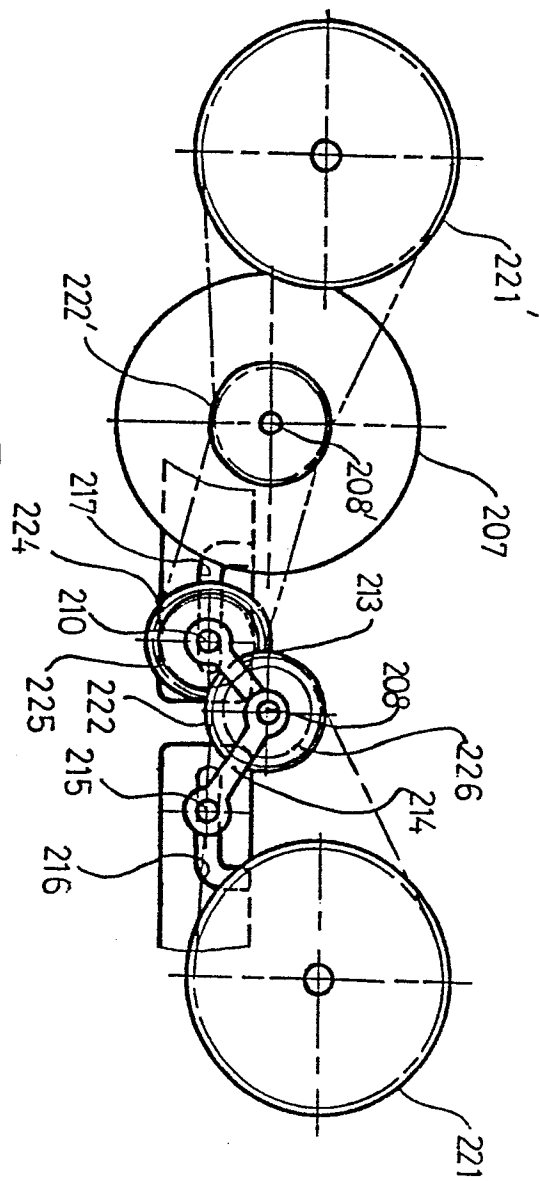


Fig. 15-1

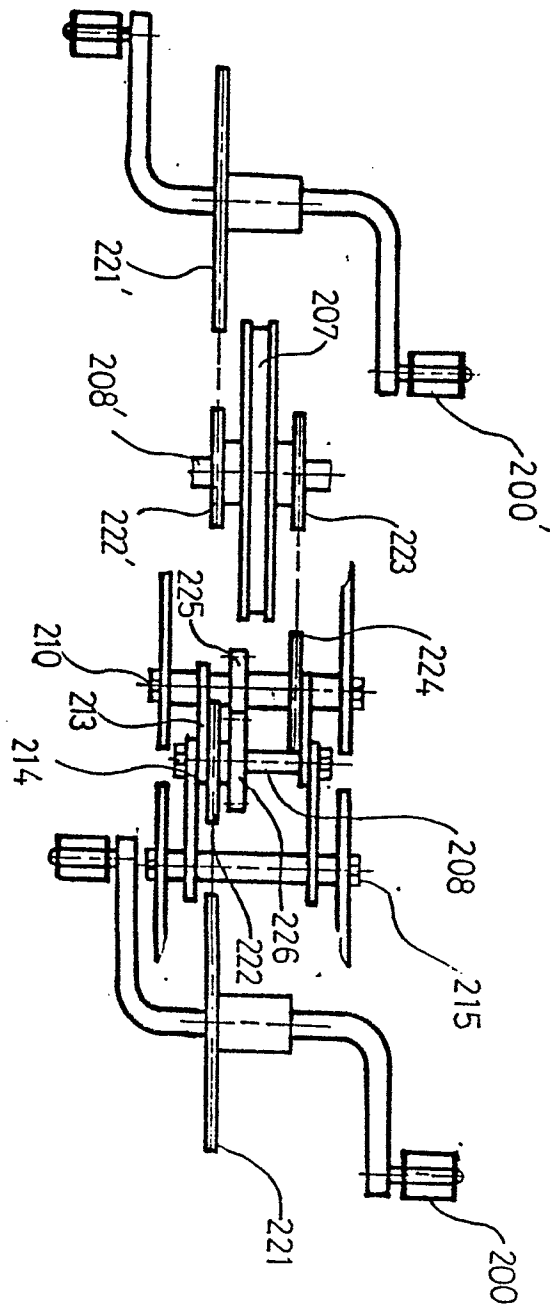


Fig. 15-2

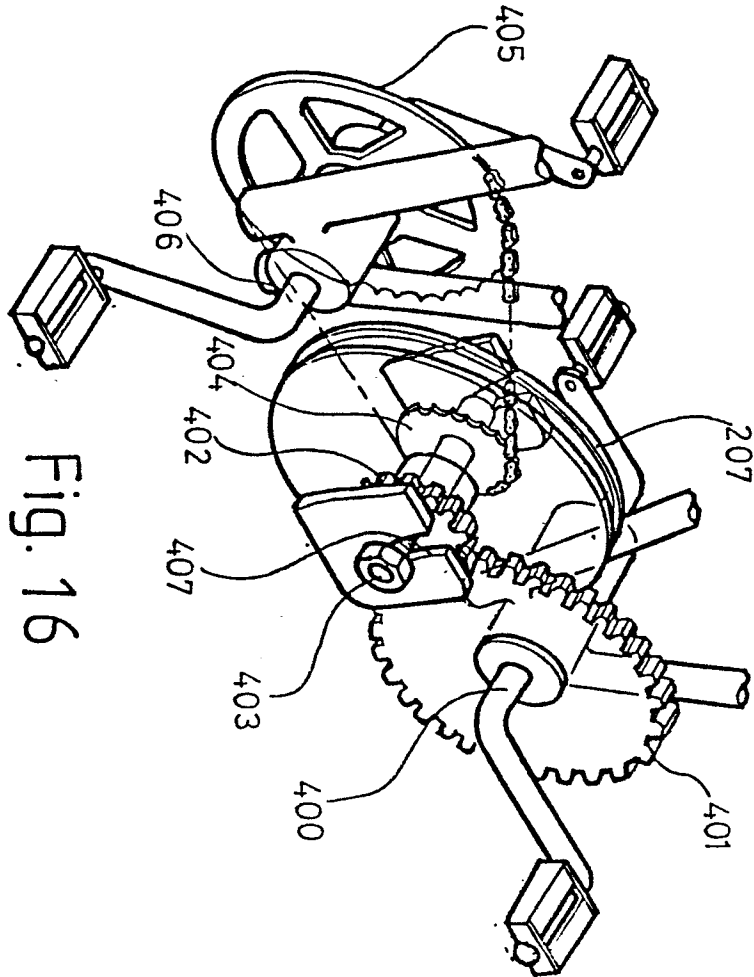


Fig. 16

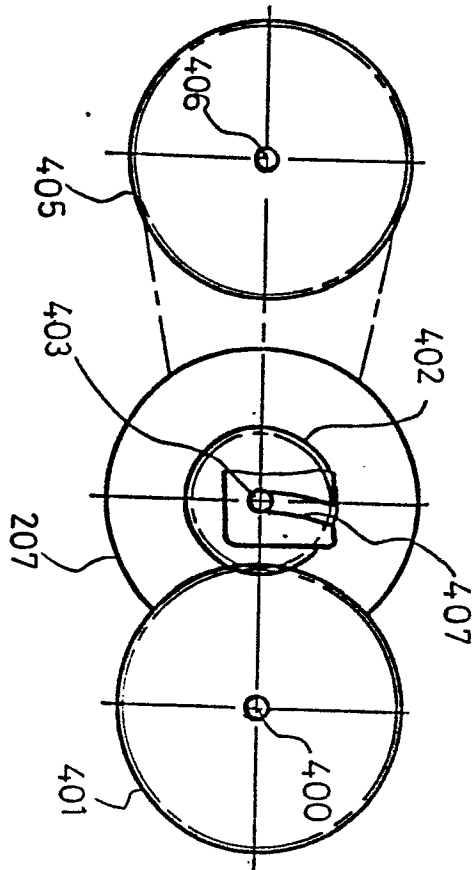


Fig. 16-1

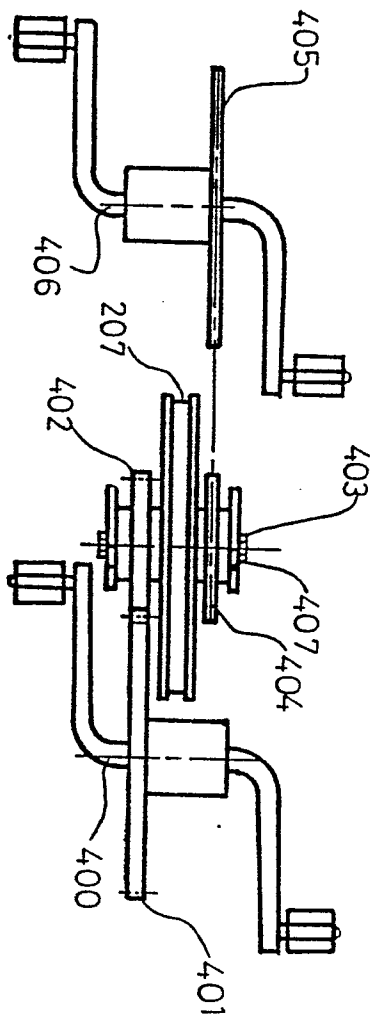


Fig. 16-2

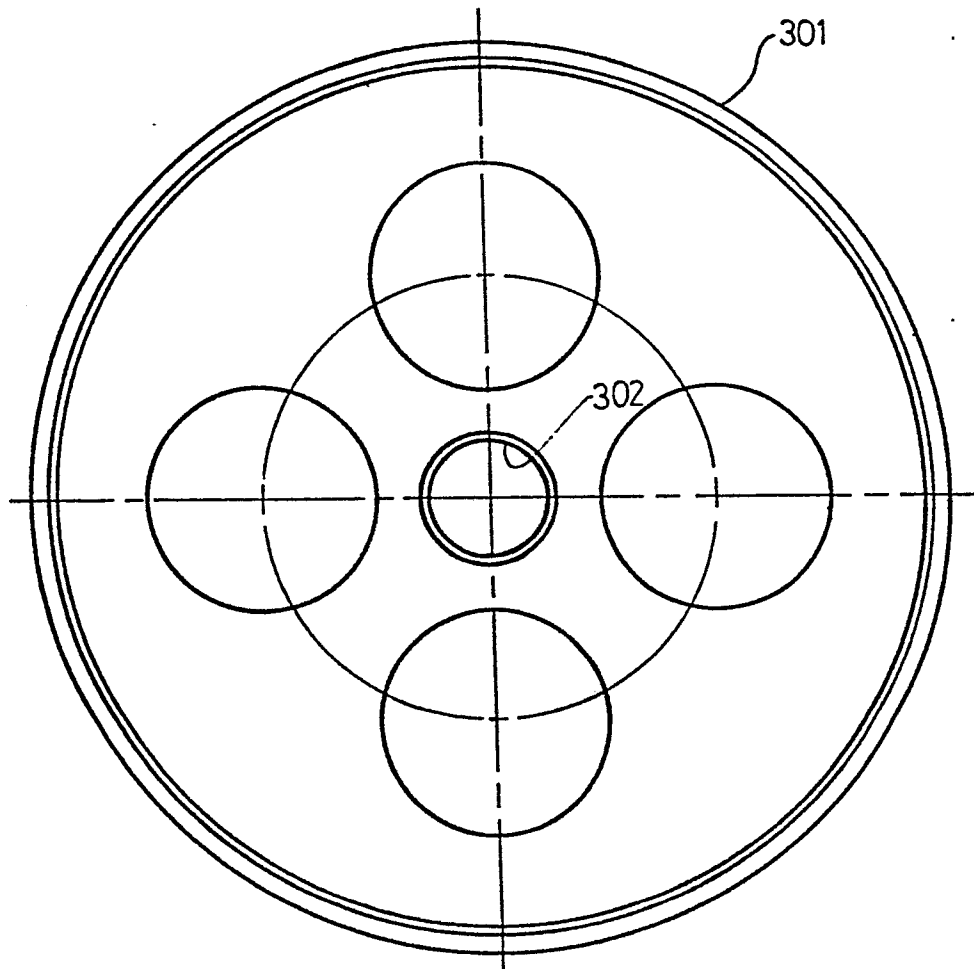


Fig. 17

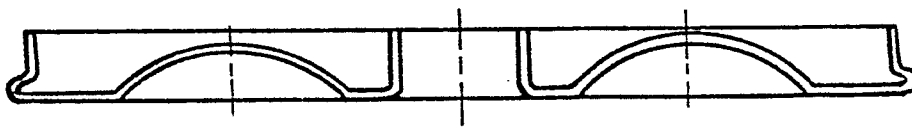


Fig.17-1

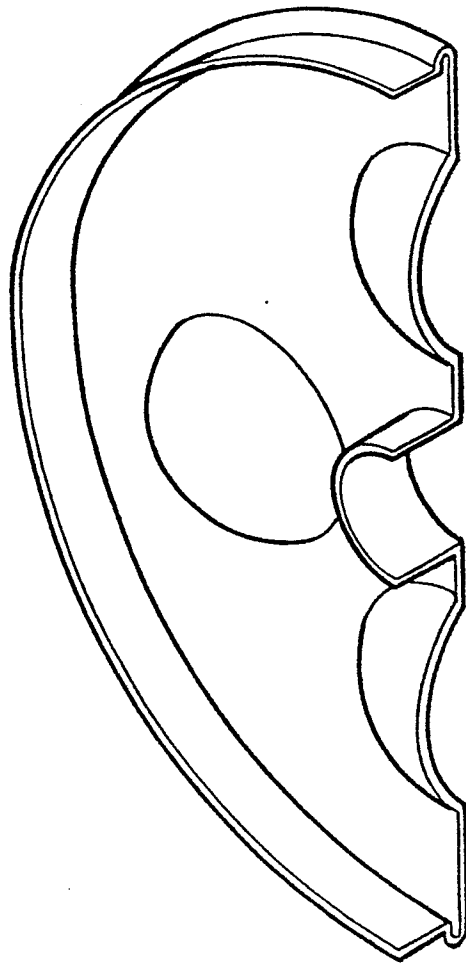


Fig.17-2

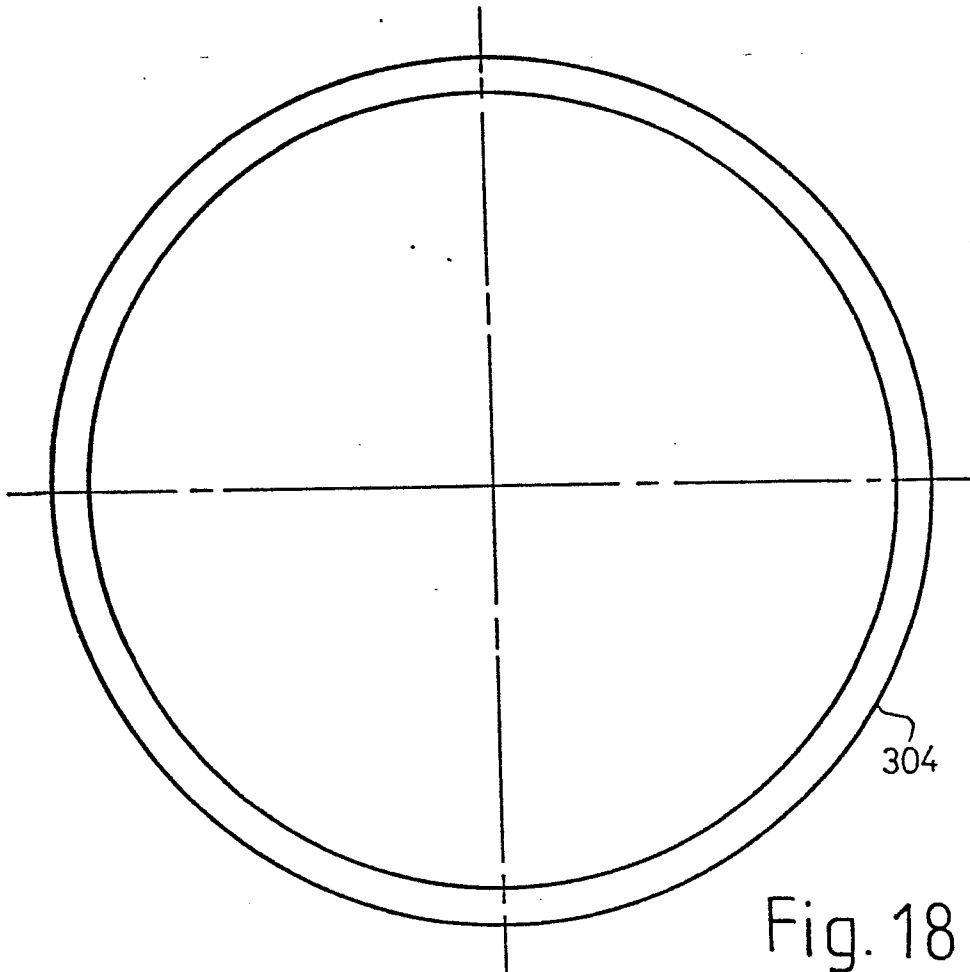


Fig. 18

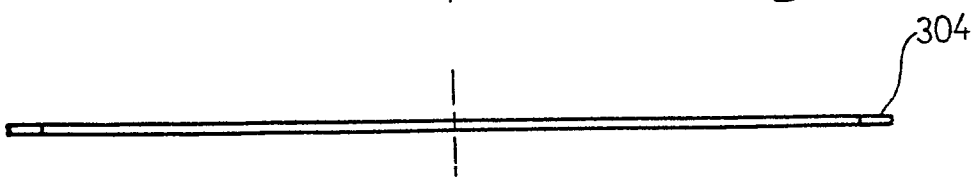


Fig. 18-1

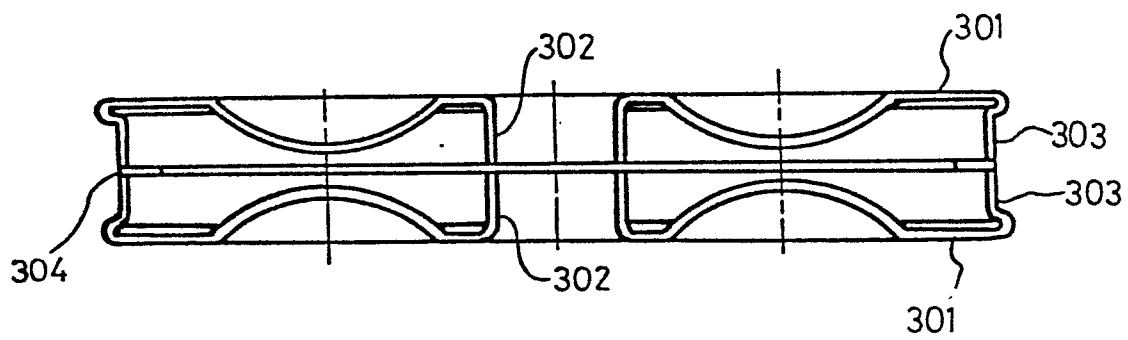


Fig. 19

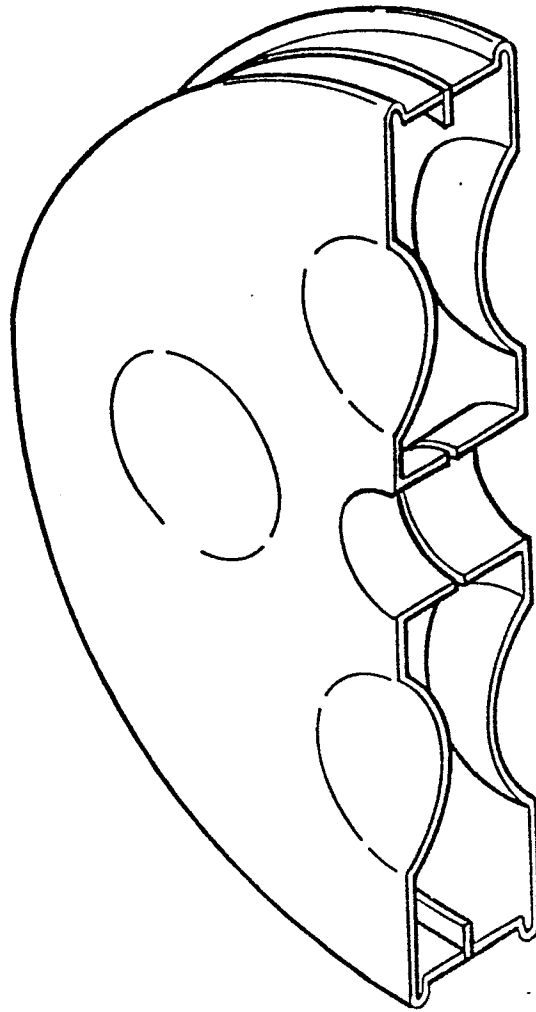


Fig. 19-1

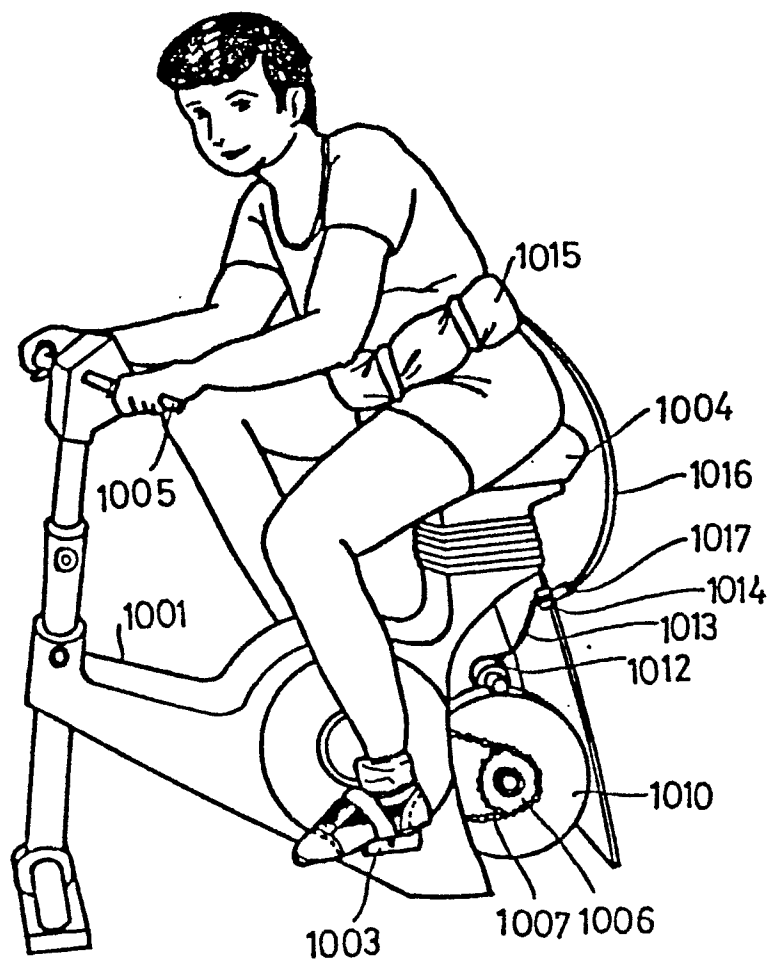


Fig. 20

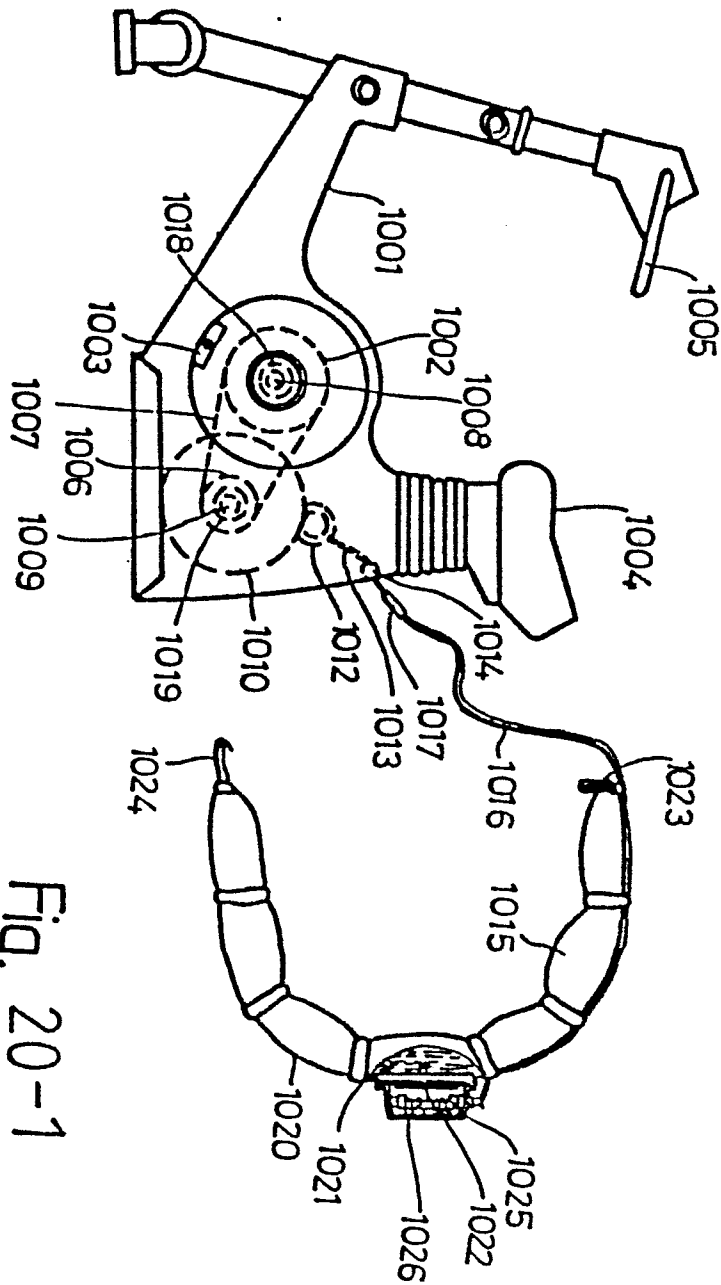


Fig. 20-1

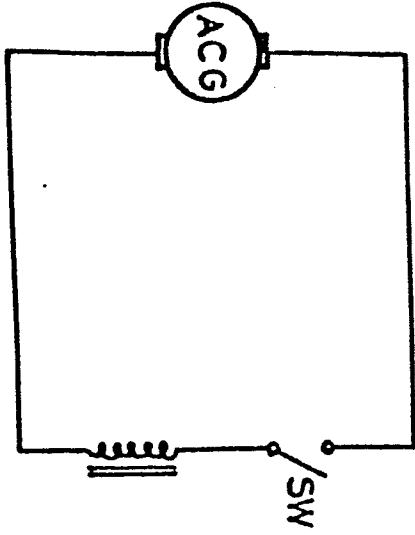


Fig. 21

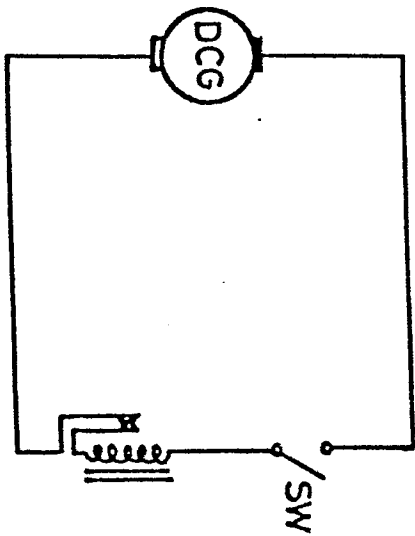


Fig. 22

